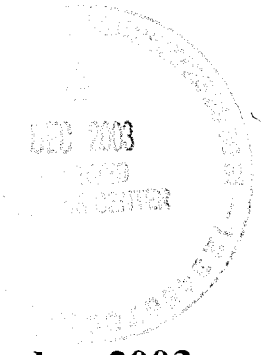
NOTICE

All drawings located at the end of the document.

Closeout Report for IHSS Group SW-1



December 2003

Closeout Report For IHSS Group SW-1

Approval received from the U.S. Environmental Protection Agency, Region 8

December 18, 2003.

Approval letter is contained in the Administrative Record.

December 2003

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Complete Data Set Compact Disc – Pre accelerated and Accelerated Action Data

ACRONYMS

ACM	asbestos-containing material
AAESP	Accelerated Action Ecological Screening Process
AL	action level
ALARA	As Low As Reasonably Achievable
AOC	Area of Concern
AR	Administrative Record
ASD	Analytical Services Division
BMP	best management practice
BZ	Buffer Zone
BZSAP	Buffer Zone Sampling and Analysis
CAD/ROD	Corrective Action Decision/Record of Decision
CAS	Chemical Abstract Service Plan
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CHWA	Colorado Hazardous Waste Act
CMS/FS	Corrective Measures Study/Feasibility Study
COC	contaminant of concern
CRA	Comprehensive Risk Assessment
cy	cubic yard
DL	detection limit
DOE	U.S. Department of Energy
dpm/100 cm^2	disintegrations per minute per 100 square centimeters
DQA	Data Quality Assessment
DQO	data quality objective
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration
ER RSOP	Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation
ft	foot
FY	Fiscal Year
HPGe	high-purity germanium
HRR	Historical Release Report
IHSS	Individual Hazardous Substance Site
K-H	Kaiser-Hill Company, L.L.C.
LCS	laboratory control sample
LLMW	low level radioactive mixed hazardous waste
LLW	low level radioactive waste
ug/kg	micrograms per kilogram
ug/L	micrograms per liter
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MS	matrix spike
MSD	matrix spike duplicate
N/A	not applicable
NFAA	No Further Accelerated Action
NLR	No Longer Representative
OPWL	Original Process Waste Lines
PAC	Potential Area of Concern
PARCCS	precision, accuracy, representativeness, completeness, comparability and sensitivity

pCi/g	picocuries per gram
PCOC	potential contaminant of concern
POC	Point of Compliance
POE	Point of Evaluation
ppt	parts per trillion
QA	quality assurance
QC	quality control
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RFI/RI	RCRA Facility Investigation/Remedial Investigation
RIN	report identification number
RPD	relative percent difference
RSOP	RFCA Standard Operating Protocol
SAP	Sampling and Analysis Plan
SBD	sample beginning depth
SED	sample ending depth
Site	Rocky Flats Environmental Technology Site
SOR	sum of ratios
SSRS	Subsurface Soil Risk Screen
SVOC	semivolatile organic compound
SWD	Soil Water Database
V&V	verification and validation
VOC	volatile organic compound
WRW	wildlife refuge worker

EXECUTIVE SUMMARY

This Closeout Report summarizes accelerated action activities conducted at Individual Hazardous Substance Sites (IHSSs) 133.5, the Incinerator Facility, and 133.6, the Concrete Wash Pad. These two IHSSs are part of IHSS Group SW-1, which consists of six other IHSSs or Potential Areas of Concern (PACs) (133.1, 133.2, 133.3, 133.4, SW-1701, SW-1702, 133.5, and 133.6) that were previously designated as No Further Accelerated Action (NFAA) Sites. Activities were planned and executed in accordance with the Environmental Restoration (ER) Regulatory Contact Record dated May 1, 2003, and the ER Rocky Flats Cleanup Agreement (RFCA) Standard Operating Protocol (RSOP) for Routine Soil Remediation (ER RSOP). Notification of the planned characterization and removal activities was provided in ER RSOP Notification #03-09. This notification was written and approved using RFCA wildlife refuge worker (WRW) and ecological receptor action levels (ALs) to make remediation decisions.

Activities were conducted between April 24, 2003 and November 17, 2003, and involved the removal of the Incinerator structure, concrete washout material, fill and ash material, and laboratory debris. Soil characterization activities were also performed to evaluate the risk to human health and environment. Characterization analytical results indicate that all soil concentrations are below the WRW ALs. Results of the data quality assessment (DQA) confirmed that the data collected and used are adequate for decision making.

Removal activities were consistent with and contributed to the ER RSOP overall long-term remedial action objectives (RAOs) for Rocky Flats Environmental Technology Site (RFETS) soil. The removal of concrete items contributed to the protection of human health and the environment, because potential sources of contamination were removed. These actions also minimized the need for long-term maintenance and institutional or engineering controls. In addition, best management practices (BMPs) were used to prevent the spread of contamination (for example, erosion and dust controls). Air monitoring data collected during the accelerated action did not indicate any exceedances.

The subsurface soil risk screen (SSRS) conducted as part of this accelerated action indicates NFAA is required. Ecological receptor exceedances (lead, beryllium, and total uranium) will be evaluated through the accelerated action ecological screening process and as part of the Comprehensive Risk Assessment (CRA). There is no groundwater contamination downgradient of the area..

This IHSS is located in an area considered to be subject to high erosion and landslides in accordance with Figure 1 of Attachment 5 of the RFCA Modification. Excavation at the site will continue to be controlled through the Site Soil Disturbance Permit process. Access will be restricted to limit disturbance to newly revegetated areas. Site access and the Soil Disturbance Permit process will remain in place pending implementation of long-term controls.

The presence of radionuclides, metals, volatile organic compounds (VOCs), and semivolatile organic compounds (SVOCs) in soil will be evaluated in the CRA, which is part of the Resource Conservation and Recovery Act (RCRA) Facility Investigation/Remedial Investigation (RFI/RI) and Corrective Measures Study/Feasibility

Study (CMS/FS) that will be conducted for the Site. The need for and extent of any more general, long-term stewardship activities will also be evaluated in the RFI/RI and CMS/FS and will be proposed as part of the preferred alternative in the Proposed Plan for the Site. Institutional controls and other long-term stewardship requirements for Rocky Flats will ultimately be contained in the Corrective Action Decision/Record of Decision (CAD/ROD), any post-closure Colorado Hazardous Waste Act (CHWA) permit that may be required, and any post-RFCA agreement.

No long-term stewardship activities are recommended for IHSSs 133.5 and 133.6 beyond the generally applicable Site requirements that may be imposed on this area in the future. Institutional controls that will be used as appropriate for this area include prohibitions on building construction, restrictions on excavation or other soil disturbance, and prohibitions on groundwater pumping in the area of IHSSs 133.5 and 133.6.

This Closeout Report and associated documentation will be retained as part of the Rocky Flats Administrative Record (AR) file. The specific long-term stewardship recommendations will also be summarized in the Rocky Flats Long-Term Stewardship Strategy.

Approval of this Closeout Report constitutes regulatory agency concurrence that this IHSS Group is an NFAA Site. An NFAA decision is justified based on the following:

- NFAA required by surface soil data;
- NFAA required by the subsurface soil risk screen;
- NFAA required by the stewardship evaluation; and
- NFAA required by the As Low As Reasonably Achievable (ALARA) consideration (that is, no elevated concentrations of radionuclides).

This information and the NFAA determination will be documented in the Fiscal Year (FY) 04 Historical Release Report (HRR).

1.0 INTRODUCTION

This Closeout Report summarizes the accelerated action activities, including characterization, conducted at Individual Hazardous Substance Sites (IHSSs) 133.5 and 133.6, which are part of IHSS Group SW-1 at the Rocky Flats Environmental Technology Site (RFETS or Site) in Golden, Colorado. IHSS Group SW-1 consists of the IHSS and Potential Area of Concern (PAC) sites listed in Table 1.

Table 1
IHSS Group SW-1 IHSS/PAC Sites

IHSS/PAC	IHSS/PAC Description
IHSS 133.1	Ash Pit 1
IHSS 133.2	Ash Pit 2
IHSS 133.3	Ash Pit 3
IHSS 133.4	Ash Pit 4
PAC SW-1701	Recently identified ash pit (also referred to as TDEM-1)
PAC SW-1702	Recently identified ash pit (also referred to as TDEM-2)
IHSS 133.5	Incinerator Facility
IHSS 133.6	Concrete Wash Pad

The location of IHSS Group SW-1 is shown on Figure 1, and the IHSS and PAC sites are shown on Figure 2.

The six ash pits were previously characterized, and results demonstrated that no further accelerated action (NFAA) was necessary at the ash pits. Results associated with IHSS 133.3 and PAC SW-1701 are presented in the 2001 Annual Update to the Historical Release Report (HRR) (DOE 2001). NFAA approval for IHSS 133.3 and PAC SW-1701 was received on February 14, 2002 (CDPHE, EPA 2002). Results associated with IHSS 133.1, IHSS 133.2, IHSS 133.4, and PAC SW-1702 are presented in the 2003 Annual Update to the HRR (DOE 2003a). NFAA approval for IHSS 133.1, IHSS 133.2, IHSS 133.4, and PAC SW-1702 was received on June 12, 2003 (EPA 2003a). Therefore, this Closeout Report focuses on presenting data and evaluating the NFAA recommendation for IHSS 133.5 and IHSS 133.6.

Characterization and accelerated action activities were planned and executed in accordance with the Buffer Zone (BZ) Sampling and Analysis Plan (SAP) (BZSAP) (DOE 2002a) and the Environmental Restoration (ER) Rocky Flats Cleanup Agreement (RFCA) Standard Operating Protocol (RSOP) for Routine Soil Remediation (ER RSOP) (DOE 2003b). These activities were initiated after the discovery of the Incinerator (IHSS 133.5) in April 2003 and the regulatory-approved removal action at the Concrete Wash Pad (IHSS 133.6). Notification of the planned activities was provided in ER RSOP

Notification #03-09 (DOE 2003c), which was approved by the U.S. Environmental Protection Agency (EPA), Region 8 on September 4, 2003 (EPA 2003b).

This report contains the information necessary to demonstrate attainment of cleanup objectives and final closure of IHSS 133.5 and IHSS 133.6, including:

- Site characterization information
  - Description of site characterization activities, and
  - Site characterization data, including data tables and maps;
- Site accelerated action information
  - Description of the accelerated action, including the rationale for the action and map of the target remediation area;
  - Map of the actual remediation area, including bounds of the excavation, and dates and durations of specific remedial activities; and
  - Photographs documenting site characterization, remediation, and reclamation activities;
- Accelerated action sampling data, including data tables and location maps, as well as a comparison of the characterization data to applicable cleanup goals;
- Description of deviations from the ER RSOP;
- Description of the Subsurface Soil Risk Screen (SSRS);
- Description of near-term stewardship actions and long-term stewardship recommendations;
- Disposition of wastes;
- Site reclamation;
- Table of No Longer Representative (NLR) locations and sample numbers that have been remediated. These data will be used to mark database records so they are not used in the Comprehensive Quality Assessment (CRA) or other Site analyses; and
- The Data Quality Assessment (DQA), including comparison of accelerated action data with project data quality objectives (DQOs).

Approval of this Closeout Report constitutes regulatory agency concurrence that this IHSS Group is an NFAA site. This information and NFAA determination will be documented in the 2004 Annual Update for the HRR.

2.0 SITE CHARACTERIZATION

Characterization information on IHSSs 133.5 and 133.6 consists of limited historical knowledge and recent analytical data. Historical information for the IHSSs was derived from previous studies (DOE 1992, 2002a) and is summarized in Sections 2.1 and 2.2. There are no historical analytical data associated with IHSSs 133.5 and 133.6. Accelerated action data are summarized in Section 2.3. A compact disc that contains the complete accelerated action data set, including quality assurance (QA) and quality control (QC) data, is enclosed with this report. Sampling specifications, including potential contaminants of concern (PCOCs) and media sampled, are presented in Table 2. Deviations from the sampling specifications are presented and explained in Table 3.

2.1 IHSS 133.5 – Incinerator

The Incinerator was located south of the West Access Road near the original RFETS western boundary (Figure 2). It was located on the side of a hill that slopes to the south towards Women Creek. The Incinerator was approximately 24 feet high and constructed of concrete walls (with rebar) on a concrete slab. The slab was approximately 12 feet by 16 feet. The Incinerator was flanked with concrete wing walls. It was in operation from 1952 through August 1968 and was used to burn office wastes. Incinerator operations ceased in 1968 because of deterioration of the fire box and stack, and was partially dismantled in 1971. Records indicate that the area around the Incinerator may have been backfilled with ash (DOE 1992).

An estimated 100 grams of depleted uranium were burned with the general combustible wastes. Until 1959, the ash and non combustible material were placed around the Incinerator and near the Concrete Wash Pad.

2.2 IHSS 133.6 – Concrete Wash Pad

The Concrete Wash Pad was adjacent to the former Incinerator (Figure 2). Excess concrete from construction activities on site was routinely washed from concrete trucks from 1953 through March 1979. Potentially contaminated ash generated from the Incinerator may have been deposited in the area of the Concrete Wash Pad.

2.3 Accelerated Action Characterization Data

Characterization soil sampling locations and analytical results for IHSSs 133.5 and 133.6 are presented on Figure 3 and in Table 4. Only results greater than background means plus two standard deviations or detection limits (DLs) are shown. Data indicate that all contaminant concentrations are below RFCA wildlife refuge worker (WRW) action levels (ALs).

However, lead, beryllium, and total uranium concentrations exceeded ecological receptor ALs at several locations (Figure 3). The majority of the lead exceedances were slightly elevated relative to background (54.62 milligrams per kilogram [mg/kg]). Only two locations, BI31-007 and BI31-011, contained results (up to 220 mg/kg) that were significantly greater than background. Beryllium concentrations (up to 4.4 mg/kg) slightly exceeded both background (0.97 mg/kg) and the ecological receptor AL (2.15

mg/kg). Total uranium concentrations (up to 110 mg/kg) at two locations, BI31-007 and BI31-011, exceeded the ecological receptor AL (67.8 mg/kg).

Several samples were also collected for dioxins and furans (Table 2). Because there are no existing RFCA ALs for dioxins and furans or congeners, analytical results were compared to EPA cleanup guidelines (EPA 1998) for residential (1,000 parts per trillion [ppt]) and industrial use (5,000 ppt). All reported values for dioxins and furans were less than the EPA cleanup benchmark for residential use (1,000 ppt).

The raw data, as of November 25, 2003, are provided on the enclosed compact disc.

Table 2
IHSS Group SW-1 Accelerated Action Characterization Specifications

IHSS Group	IHSS/PAC/UBC Site	Location Code	Easting	Northing	Media	Depth Interval (feet)	Analyte	Laboratory Method
SW-1	IHSS 133.5	BI30-000	2079231.78	747510.38	Surface Soil	0-0.5	Metals	6200
		BI30-000	2079231.78	747510.38	Surface Soil	0-0.5	Radionuclides	HPGe
		BI30-001	2079326.11	747500.42	Surface Soil	0-0.5	Metals	6200
		BI30-001	2079326.11	747500.42	Surface Soil	0-0.5	Radionuclides	HPGe
		BI30-002	2079361.43	747471.75	Surface Soil	0-0.5	Radionuclides	HPGe
		BI30-002	2079361.43	747471.75	Surface Soil	0-0.5	Metals	6010
		BI30-003	2079354.01	747483.50	Surface Soil	0-0.5	Radionuclides	HPGe
		BI30-003	2079354.01	747483.50	Surface Soil	0-0.5	Metals	6010
		BI31-001	2079216.83	747693.72	Subsurface Soil	1-1.5	Metals	6010
		BI31-001	2079216.83	747693.72	Subsurface Soil	1-1.5	Radionuclides	HPGe
		BI31-002	2079226.82	747683.68	Subsurface Soil	1-1.5	Metals	6010
		BI31-002	2079226.82	747683.68	Subsurface Soil	1-1.5	Radionuclides	HPGe
		BI31-003	2079216.83	747673.71	Subsurface Soil	1-1.5	Metals	6010
		BI31-003	2079216.83	747673.71	Subsurface Soil	1-1.5	Radionuclides	HPGe
		BI31-004	2079206.87	747683.69	Subsurface Soil	1-1.5	Metals	6010
		BI31-004	2079206.87	747683.69	Subsurface Soil	1-1.5	Radionuclides	HPGe
		BI31-005	2079305.00	747721.03	Surface Soil	0-0.5	Metals	6200
		BI31-005	2079305.00	747721.03	Surface Soil	0-0.5	VOCs	8260
		BI31-005	2079305.00	747721.03	Surface Soil	0-0.5	SVOCs	8270
		BI31-005	2079305.00	747721.03	Surface Soil	0-0.5	Radionuclides	HPGe
		BI31-006	2079325.46	747711.79	Surface Soil	0-0.5	Metals	6200
		BI31-006	2079325.46	747711.79	Surface Soil	0-0.5	VOCs	8260
		BI31-006	2079325.46	747711.79	Surface Soil	0-0.5	SVOCs	8270
		BI31-006	2079325.46	747711.79	Surface Soil	0-0.5	Radionuclides	HPGe
		BI31-007	2079307.50	747701.59	Surface Soil	0-0.5	Metals	6010
		BI31-007	2079307.50	747701.59	Surface Soil	0-0.5	VOCs	8260
		BI31-007	2079307.50	747701.59	Surface Soil	0-0.5	Dioxins/Furans	8290
		BI31-007	2079307.50	747701.59	Surface Soil	0-0.5	Radionuclides	ALPHA SPEC

IHSS Group	IHSS/PAC/UBC Site	Location Code	Easting	Northing	Media	Depth Interval (feet)	Analyte	Laboratory Method
		BI31-007	2079307.50	747701.59	Surface Soil	0-0.5	Radionuclides	HPGe
		BI31-008	2079314.40	747695.22	Surface Soil	0-0.5	Metals	6010
		BI31-008	2079314.40	747695.22	Surface Soil	0-0.5	VOCs	8260
		BI31-008	2079314.40	747695.22	Surface Soil	0-0.5	Dioxins/Furans	8290
		BI31-008	2079314.40	747695.22	Surface Soil	0-0.5	Radionuclides	HPGe
		BI31-009	2079319.09	747695.10	Subsurface Soil	0.5-1.5	Metals	6010
		BI31-009	2079319.09	747695.10	Subsurface Soil	0.5-1.5	VOCs	8260
		BI31-009	2079319.09	747695.10	Subsurface Soil	0.5-1.5	Dioxins/Furans	8290
		BI31-009	2079319.09	747695.10	Subsurface Soil	0.5-1.5	Radionuclides	HPGe
		BI31-009-01	2079314.40	747695.22	Surface Soil	0-0.5	Metals	6010
		BI31-009-01	2079314.40	747695.22	Surface Soil	0-0.5	VOCs	8260
		BI31-009-01	2079314.40	747695.22	Surface Soil	0-0.5	Dioxins/Furans	8290
		BI31-009-01	2079314.40	747695.22	Surface Soil	0-0.5	Radionuclides	HPGe
		BI31-010	2079322.57	747699.23	Surface Soil	0-0.5	Metals	6010
		BI31-010	2079322.57	747699.23	Surface Soil	0-0.5	VOCs	8260
		BI31-010	2079322.57	747699.23	Surface Soil	0-0.5	Dioxins/Furans	8290
		BI31-010	2079322.57	747699.23	Surface Soil	0-0.5	Radionuclides	HPGe
		BI31-011	2079335.27	747707.74	Surface Soil	0-0.5	Metals	6010
		BI31-011	2079335.27	747707.74	Surface Soil	0-0.5	VOCs	8260
		BI31-011	2079335.27	747707.74	Surface Soil	0-0.5	Dioxins/Furans	8290
		BI31-011	2079335.27	747707.74	Surface Soil	0-0.5	Radionuclides	HPGe
		BI31-012	2079306.52	747676.98	Surface Soil	0-0.5	Dioxins/Furans	8290
		BI31-013	2079284.61	747698.93	Surface Soil	0-0.5	Dioxins/Furans	8290
		BI31-015	2079317.51	747713.92	Surface Soil	0-0.5	VOCs	8260
		BI31-015	2079317.51	747713.92	Surface Soil	0-0.5	Radionuclides	HPGe
		BI31-016	2079315.95	747700.01	Surface Soil	0-0.5	VOCs	8260
		BI31-016	2079315.95	747700.01	Surface Soil	0-0.5	Radionuclides	HPGe
		BJ31-000	2079341.11	747598.06	Surface Soil	0-0.5	Metals	6200
		BJ31-000	2079341.11	747598.06	Surface Soil	0-0.5	Radionuclides	HPGe
		BJ31-001	2079383.47	747607.47	Surface Soil	0-0.5	Metals	6200

IHSS Group	IHSS/PAC/UBC Site	Location Code	Easting	Northing	Media	Depth Interval (feet)	Analyte	Laboratory Method
		BJ31-001	2079383.47	747607.47	Surface Soil	0-0.5	Radionuclides	HPGe
		BJ31-002	2079365.33	747587.95	Surface Soil	0-0.5	Metals	6200
		BJ31-002	2079365.33	747587.95	Surface Soil	0-0.5	Radionuclides	HPGe
		BJ31-003	2079346.09	747567.81	Surface Soil	0-0.5	Metals	6200
		BJ31-003	2079346.09	747567.81	Surface Soil	0-0.5	Radionuclides	HPGe
		BJ31-004	2079392.53	747578.68	Surface Soil	0-0.5	Metals	6200
		BJ31-004	2079392.53	747578.68	Surface Soil	0-0.5	Radionuclides	HPGe
		BJ31-005	2079361.77	747687.28	Surface Soil	0-0.5	Dioxins/Furans	8290
		BJ31-006	2079349.54	747670.42	Surface Soil	0-0.5	Dioxins/Furans	8290
		BL32-000	2079811.70	747898.19	Surface Soil	0-0.5	Metals	6200
		BL32-000	2079811.70	747898.19	Surface Soil	0-0.5	Radionuclides	HPGe
		BM31-000	2079993.26	747605.80	Surface Soil	0-0.5	Metals	6200
		BM31-000	2079993.26	747605.80	Surface Soil	0-0.5	Radionuclides	HPGe
		BM31-001	2079976.78	747659.45	Surface Soil	0-0.5	Metals	6200
		BM31-001	2079976.78	747659.45	Surface Soil	0-0.5	Radionuclides	HPGe
		BM31-002	2079969.96	747710.75	Surface Soil	0-0.5	Metals	6200
		BM31-002	2079969.96	747710.75	Surface Soil	0-0.5	Radionuclides	HPGe
		BN33-000	2080185.71	747994.07	Surface Soil	0-0.5	Metals	6200
		BN33-000	2080185.71	747994.07	Surface Soil	0-0.5	Radionuclides	HPGe
		INCINERATOR-EAST	2079064.93	747563.13	Surface Soil	0-0.3	Radionuclides	HPGe
		INCINERATOR-EAST	2079064.93	747563.13	Surface Soil	0-0.3	Radionuclides	HPGe
		INCINERATOR-WEST	2079027.28	747565.99	Surface Soil	0-0.3	Radionuclides	ALPHA SPEC
		INCINERATOR-WEST	2079027.28	747565.99	Surface Soil	0-0.3	Radionuclides	HPGe
	IHSS 133.6	BH30-000	2079120.40	747470.73	Subsurface Soil	0.5-1	Metals	6010
		BH30-000	2079120.40	747470.73	Subsurface Soil	0.5-1	Radionuclides	HPGe
		BH30-000	2079120.40	747470.73	Surface Soil	0-0.5	Radionuclides	ALPHA SPEC
		BI31-000	2079120.40	747470.73	Subsurface Soil	0.5-2.5	Metals	6010
		BI31-000	2079120.40	747470.73	Subsurface Soil	0.5-2.5	Radionuclides	HPGe

Table 3
Deviations From the Characterization Specifications

Location Code	Planned Easting	Planned Northing	Actual Easting	Actual Northing	Comments
BH30-000	2079120.40	747470.73	2079120.40	747470.73	No deviations
BI30-000	2079231.78	747510.38	2079231.78	747510.38	No deviations
BI30-001	2079326.11	747500.42	2079326.11	747500.42	No deviations
BI30-002	2079361.43	747471.75	2079361.43	747471.75	No deviations
BI30-003	2079354.01	747483.50	2079354.01	747483.50	No deviations
BI31-000	2079120.40	747470.73	2079120.40	747470.73	No deviations
BI31-001	2079216.83	747693.72	2079216.83	747693.72	No deviations
BI31-002	2079226.82	747683.68	2079226.82	747683.68	No deviations
BI31-003	2079216.83	747673.71	2079216.83	747673.71	No deviations
BI31-004	2079206.87	747683.69	2079206.87	747683.69	No deviations
BI31-005	2079305.00	747721.03	2079305.00	747721.03	No deviations
BI31-006	2079325.46	747711.79	2079325.46	747711.79	No deviations
BI31-007	2079307.50	747701.59	2079307.50	747701.59	No deviations
BI31-008	2079314.40	747695.22	2079314.40	747695.22	No deviations
BI31-009	2079319.09	747695.10	2079319.09	747695.10	No deviations
BI31-009-01	2079314.40	747695.22	2079314.40	747695.22	No deviations
BI31-010	2079322.57	747699.23	2079322.57	747699.23	No deviations
BI31-011	2079335.27	747707.74	2079335.27	747707.74	No deviations
BI31-012	2079306.52	747676.98	2079306.52	747676.98	No deviations
BI31-013	2079284.61	747698.93	2079284.61	747698.93	No deviations
BI31-015	2079317.51	747713.92	2079317.51	747713.92	No deviations
BI31-016	2079315.95	747700.01	2079315.95	747700.01	No deviations
BJ30-000	2079404.03	747470.83	2079404.03	747470.83	No deviations
BJ31-001	2079383.47	747607.47	2079383.47	747607.47	No deviations
BJ31-002	2079365.33	747587.95	2079365.33	747587.95	No deviations
BJ31-003	2079346.09	747567.81	2079346.09	747567.81	No deviations
BJ31-004	2079392.53	747578.68	2079392.53	747578.68	No deviations
BJ31-005	2079361.77	747687.28	2079361.77	747687.28	No deviations
BJ31-006	2079349.54	747670.42	2079349.54	747670.42	No deviations
BJ32-000	2079472.36	747838.52	2079472.36	747838.52	No deviations
BL32-000	2079811.70	747898.19	2079811.70	747898.19	No deviations
BM31-000	2079993.26	747605.80	2079993.26	747605.80	No deviations
BM31-001	2079976.78	747659.45	2079976.78	747659.45	No deviations
BM31-002	2079969.96	747710.75	2079969.96	747710.75	No deviations
BN33-000	2080185.71	747994.07	2080185.71	747994.07	No deviations
INCINERATOR-EAST	2079064.93	747563.13	2079064.93	747563.13	No deviations
INCINERATOR-WEST	2079027.28	747565.99	2079027.28	747565.99	No deviations

THIS TARGET SHEET REPRESENTS AN
OVER-SIZED MAP / PLATE FOR THIS DOCUMENT:
(Ref: 03-RF-01849; JLB-150-03)

Closeout Report for IHSS Group SW-1 (Incinerator)

December 2003

Figure 3:

Accelerated Action Sampling Locations and Results at IHSS 133.5 and IHSS 133.6

File: w:\projects\fy2004\SW-1\SW-1_clrpt_dcr_2.apr

November 2003

CERCLA Administrative Record Document, BZ-Z-000650

U.S. DEPARTEMENT OF ENERGY
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

GOLDEN, COLORADO

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Table 4
Accelerated Action Characterization Data for IHSSs 133.5 and 133.6

Location	Analyte	SBD (ft)	SED (ft)	DL	Background Mean + 2 SD	Result	WRW Action Level	Ecological Receptor Action Level	Unit
BH30-000	Uranium, Total	0	0.5	5.34	5.98	12.14	2750	67.8	mg/kg
BH30-000	Uranium-234	0	0.5	1.80	2.25	4.09	300	1800	pCi/g
BH30-000	Uranium, Total	0.5	1	5.32	3.04	12.82	2750	67.8	mg/kg
BH30-000	Uranium-234	0.5	1	1.79	2.64	4.32	300	1800	pCi/g
BH30-000	Uranium-235	0.5	1	0.14	0.12	0.24	8	1900	pCi/g
BH30-000	Uranium-238	0.5	1	1.79	1.49	4.32	351	1600	pCi/g
BI30-000	Barium	0	0.5	98.00	141.26	846.00	26400	-	mg/kg
BI30-000	Chromium	0	0.5	20.00	16.99	51.20	268	-	mg/kg
BI30-000	Copper	0	0.5	4.00	18.06	49.60	40900	-	mg/kg
BI30-000	Iron	0	0.5	2190.00	18037.00	33900.00	307000	-	mg/kg
BI30-000	**Lead**	**0**	**0.5**	**7.00**	**54.62**	**46.60**	**1000**	**25.6**	**mg/kg**
BI30-000	Manganese	0	0.5	158.00	365.08	499.00	3480	-	mg/kg
BI30-000	Nickel	0	0.5	12.00	14.91	40.80	20400	-	mg/kg
BI30-000	Strontium	0	0.5	20.00	48.94	258.00	613000	-	mg/kg
BI30-000	Uranium, Total	0	0.5	6.14	5.98	12.18	2750	67.8	mg/kg
BI30-000	Uranium-234	0	0.5	2.07	2.25	4.10	300	1800	pCi/g
BI30-000	Uranium-235	0	0.5	0.22	0.09	0.25	8	1900	pCi/g
BI30-000	Uranium-238	0	0.5	2.07	2.00	4.10	351	1600	pCi/g
BI30-000	Vanadium	0	0.5	31.00	45.59	160.00	7150	433	mg/kg
BI30-000	Zinc	0	0.5	9.00	73.76	116.00	307000	-	mg/kg
BI30-001	Arsenic	0	0.5	5.00	10.09	10.10	22.2	21.6	mg/kg
BI30-001	Barium	0	0.5	98.00	141.26	824.00	26400	-	mg/kg
BI30-001	Cadmium	0	0.5	3.00	1.61	4.39	962	-	mg/kg
BI30-001	Chromium	0	0.5	20.00	16.99	43.70	268	-	mg/kg
BI30-001	Copper	0	0.5	4.00	18.06	47.60	40900	-	mg/kg
BI30-001	Iron	0	0.5	2190.00	18037.00	30300.00	307000	-	mg/kg
BI30-001	**Lead**	**0**	**0.5**	**7.00**	**54.62**	**74.60**	**1000**	**25.6**	**mg/kg**
BI30-001	Manganese	0	0.5	158.00	365.08	558.00	3480	-	mg/kg

Location	Analyte	SBD (ft)	SED (ft)	DL	Background Mean + 2 SD	Result	WRW Action Level	Ecological Receptor Action Level	Unit
BI30-001	Nickel	0	0.5	12.00	14.91	36.20	20400	-	mg/kg
BI30-001	Strontium	0	0.5	20.00	48.94	308.00	613000	-	mg/kg
BI30-001	Tin	0	0.5	4.00	2.90	6.43	613000	-	mg/kg
BI30-001	Uranium, Total	0	0.5	5.68	5.98	15.74	2750	67.8	mg/kg
BI30-001	Uranium-234	0	0.5	1.91	2.25	5.30	300	1800	pCi/g
BI30-001	Uranium-235	0	0.5	0.21	0.09	0.41	8	1900	pCi/g
BI30-001	Uranium-238	0	0.5	1.91	2.00	5.30	351	1600	pCi/g
BI30-001	Vanadium	0	0.5	31.00	45.59	144.00	7150	433	mg/kg
BI30-001	Zinc	0	0.5	9.00	73.76	168.00	307000	-	mg/kg
BI30-002	Aluminum	0	0.5	5.30	16902.00	22000.00	228000	-	mg/kg
BI30-002	Barium	0	0.5	0.40	141.26	190.00	26400	-	mg/kg
BI30-002	Chromium	0	0.5	0.17	16.99	26.00	268	-	mg/kg
BI30-002	Cobalt	0	0.5	0.20	10.91	11.00	1550	-	mg/kg
BI30-002	Copper	0	0.5	0.05	18.06	30.00	40900	-	mg/kg
BI30-002	Iron	0	0.5	1.50	18037.00	19000.00	307000	-	mg/kg
BI30-002	**Lead**	**0**	**0.5**	**0.30**	**54.62**	**39.00**	**1000**	**25.6**	**mg/kg**
BI30-002	Lithium	0	0.5	0.53	11.55	16.00	20400	-	mg/kg
BI30-002	Manganese	0	0.5	0.19	365.08	430.00	3480	-	mg/kg
BI30-002	Nickel	0	0.5	0.21	14.91	18.00	20400	-	mg/kg
BI30-002	Strontium	0	0.5	0.06	48.94	88.00	613000	-	mg/kg
BI30-002	Uranium, Total	0	0.5	4.81	5.98	34.24	2750	67.8	mg/kg
BI30-002	Uranium-234	0	0.5	1.62	2.25	11.53	300	1800	pCi/g
BI30-002	Uranium-235	0	0.5	0.17	0.09	0.38	8	1900	pCi/g
BI30-002	Uranium-238	0	0.5	1.62	2.00	11.53	351	1600	pCi/g
BI30-002	Vanadium	0	0.5	0.51	45.59	53.00	7150	433	mg/kg
BI30-002	Zinc	0	0.5	0.50	73.76	160.00	307000	-	mg/kg
BI30-003	Chromium	0	0.5	0.16	16.99	20.00	268	-	mg/kg
BI30-003	Copper	0	0.5	0.05	18.06	86.00	40900	-	mg/kg
BI30-003	**Lead**	**0**	**0.5**	**0.29**	**54.62**	**37.00**	**1000**	**25.6**	**mg/kg**
BI30-003	Lithium	0	0.5	0.52	11.55	12.00	20400	-	mg/kg

Location	Analyte	SBD (ft)	SED (ft)	DL	Background Mean + 2 SD	Result	WRW Action Level	Ecological Receptor Action Level	Unit
BI30-003	Strontium	0	0.5	0.06	48.94	94.00	613000	-	mg/kg
BI30-003	Uranium, Total	0	0.5	1.58	5.98	25.27	2750	67.8	mg/kg
BI30-003	Uranium-234	0	0.5	0.53	2.25	8.51	300	1800	pCi/g
BI30-003	Uranium-235	0	0.5	0.10	0.09	0.17	8	1900	pCi/g
BI30-003	Uranium-238	0	0.5	0.53	2.00	8.51	351	1600	pCi/g
BI30-003	Vanadium	0	0.5	0.49	45.59	48.00	7150	433	mg/kg
BI31-000	Uranium, Total	0	0.5	5.36	5.98	14.11	2750	67.8	mg/kg
BI31-000	Uranium-234	0	0.5	1.81	2.25	4.75	300	1800	pCi/g
BI31-000	Uranium, Total	0.5	2.5	6.47	3.04	11.09	2750	67.8	mg/kg
BI31-000	Uranium-234	0.5	2.5	2.18	2.64	3.73	300	1800	pCi/g
BI31-000	Uranium-235	0.5	2.5	0.15	0.12	0.27	8	1900	pCi/g
BI31-000	Uranium-238	0.5	2.5	2.18	1.49	3.73	351	1600	pCi/g
BI31-001	Uranium, Total	0	0.5	4.74	5.98	12.54	2750	67.8	mg/kg
BI31-001	Uranium-234	0	0.5	1.59	2.25	4.22	300	1800	pCi/g
BI31-001	Uranium-235	0	0.5	0.14	0.09	0.25	8	1900	pCi/g
BI31-001	Uranium-238	0	0.5	1.59	2.00	4.22	351	1600	pCi/g
BI31-001	Uranium, Total	1	1.5	5.81	3.04	11.88	2750	67.8	mg/kg
BI31-001	Uranium-234	1	1.5	1.96	2.64	4.00	300	1800	pCi/g
BI31-001	Uranium-235	1	1.5	0.16	0.12	0.18	8	1900	pCi/g
BI31-001	Uranium-238	1	1.5	1.96	1.49	4.00	351	1600	pCi/g
BI31-002	Uranium, Total	0	0.5	5.36	5.98	12.11	2750	67.8	mg/kg
BI31-002	Uranium-234	0	0.5	1.81	2.25	4.08	300	1800	pCi/g
BI31-002	Uranium-235	0	0.5	0.14	0.09	0.19	8	1900	pCi/g
BI31-002	Uranium-238	0	0.5	1.81	2.00	4.08	351	1600	pCi/g
BI31-002	**Lead**	**1**	**1.5**	**0.18**	**24.97**	**32.00**	**1000**	**25.6**	**mg/kg**
BI31-002	Uranium, Total	1	1.5	5.98	3.04	16.87	2750	67.8	mg/kg
BI31-002	Uranium-234	1	1.5	2.01	2.64	5.68	300	1800	pCi/g
BI31-002	Uranium-235	1	1.5	0.17	0.12	0.30	8	1900	pCi/g
BI31-002	Uranium-238	1	1.5	2.01	1.49	5.68	351	1600	pCi/g
BI31-003	Uranium, Total	0	0.5	4.65	5.98	14.20	2750	67.8	mg/kg

Location	Analyte	SBD (ft)	SED (ft)	DL	Background Mean + 2 SD	Result	WRW Action Level	Ecological Receptor Action Level	Unit
BI31-003	Uranium-234	0	0.5	1.57	2.25	4.78	300	1800	pCi/g
BI31-003	Uranium-235	0	0.5	0.17	0.09	0.21	8	1900	pCi/g
BI31-003	Uranium-238	0	0.5	1.57	2.00	4.78	351	1600	pCi/g
BI31-003	Uranium, Total	1	1.5	4.84	3.04	11.56	2750	67.8	mg/kg
BI31-003	Uranium-234	1	1.5	1.63	2.64	3.89	300	1800	pCi/g
BI31-003	Uranium-235	1	1.5	0.19	0.12	0.23	8	1900	pCi/g
BI31-003	Uranium-238	1	1.5	1.63	1.49	3.89	351	1600	pCi/g
BI31-004	Uranium, Total	0	0.5	4.68	5.98	10.97	2750	67.8	mg/kg
BI31-004	Uranium-234	0	0.5	1.58	2.25	3.70	300	1800	pCi/g
BI31-004	Uranium-235	0	0.5	0.13	0.09	0.17	8	1900	pCi/g
BI31-004	Uranium-238	0	0.5	1.58	2.00	3.70	351	1600	pCi/g
BI31-004	**Lead**	**1**	**1.5**	**0.16**	**24.97**	**31.00**	**1000**	**25.6**	**mg/kg**
BI31-004	Uranium, Total	1	1.5	5.39	3.04	7.63	2750	67.8	mg/kg
BI31-004	Uranium-235	1	1.5	0.12	0.12	0.17	8	1900	pCi/g
BI31-004	Uranium-238	1	1.5	1.81	1.49	2.57	351	1600	pCi/g
BI31-005	Antimony	0	0.5	7.00	0.47	7.19	409	-	mg/kg
BI31-005	Arsenic	0	0.5	5.00	10.09	11.00	22.2	21.6	mg/kg
BI31-005	Barium	0	0.5	98.00	141.26	533.00	26400	-	mg/kg
BI31-005	Benzo(a)anthracene	0	0.5	44.00	N/A	67.00	34900	800000	ug/kg
BI31-005	Benzo(b)fluoranthene	0	0.5	72.00	N/A	80.00	34900	1010000	ug/kg
BI31-005	Chromium	0	0.5	20.00	16.99	42.80	268	-	mg/kg
BI31-005	Chrysene	0	0.5	39.00	N/A	73.00	3490000	-	ug/kg
BI31-005	Copper	0	0.5	4.00	18.06	30.50	40900	-	mg/kg
BI31-005	Fluoranthene	0	0.5	44.00	N/A	140.00	27200000	-	ug/kg
BI31-005	Iron	0	0.5	2190.00	18037.00	33100.00	307000	-	mg/kg
BI31-005	**Lead**	**0**	**0.5**	**7.00**	**54.62**	**26.70**	**1000**	**25.6**	**mg/kg**
BI31-005	Nickel	0	0.5	12.00	14.91	39.80	20400	-	mg/kg
BI31-005	Pyrene	0	0.5	64.00	N/A	100.00	22100000	-	ug/kg
BI31-005	Strontium	0	0.5	20.00	48.94	153.00	613000	-	mg/kg
BI31-005	Uranium, Total	0	0.5	5.16	5.98	11.74	2750	67.8	mg/kg

Location	Analyte	SBD (ft)	SED (ft)	DL	Background Mean + 2 SD	Result	WRW Action Level	Ecological Receptor Action Level	Unit
BI31-005	Uranium-234	0	0.5	1.74	2.25	3.95	300	1800	pCi/g
BI31-005	Uranium-235	0	0.5	0.15	0.09	0.21	8	1900	pCi/g
BI31-005	Uranium-238	0	0.5	1.74	2.00	3.95	351	1600	pCi/g
BI31-005	Vanadium	0	0.5	31.00	45.59	134.00	7150	433	mg/kg
BI31-005	Zinc	0	0.5	9.00	73.76	90.60	307000	-	mg/kg
BI31-006	Arsenic	0	0.5	5.00	10.09	18.20	22.2	21.6	mg/kg
BI31-006	Barium	0	0.5	98.00	141.26	592.00	26400	-	mg/kg
BI31-006	Chromium	0	0.5	20.00	16.99	48.70	268	-	mg/kg
BI31-006	Copper	0	0.5	4.00	18.06	29.60	40900	-	mg/kg
BI31-006	Iron	0	0.5	2190.00	18037.00	40600.00	307000	-	mg/kg
BI31-006	**Lead**	**0**	**0.5**	**7.00**	**54.62**	**33.40**	**1000**	**25.6**	**mg/kg**
BI31-006	Nickel	0	0.5	12.00	14.91	52.40	20400	-	mg/kg
BI31-006	Strontium	0	0.5	20.00	48.94	166.00	613000	-	mg/kg
BI31-006	Uranium, Total	0	0.5	4.73	5.98	9.01	2750	67.8	mg/kg
BI31-006	Uranium-234	0	0.5	1.59	2.25	3.03	300	1800	pCi/g
BI31-006	Uranium-235	0	0.5	0.12	0.09	0.22	8	1900	pCi/g
BI31-006	Uranium-238	0	0.5	1.59	2.00	3.03	351	1600	pCi/g
BI31-006	Vanadium	0	0.5	31.00	45.59	146.00	7150	433	mg/kg
BI31-007	Aluminum	0	0.5	4.80	16902.00	18000.00	228000	-	mg/kg
BI31-007	Antimony	0	0.5	0.28	0.47	3.40	409	-	mg/kg
BI31-007	Barium	0	0.5	0.36	141.26	180.00	26400	-	mg/kg
BI31-007	Benzene	0	0.5	6.00	N/A	1.40	205000	-	ug/kg
BI31-007	**Beryllium**	**0**	**0.5**	**0.10**	**0.97**	**3.20**	**921**	**2.15**	**mg/kg**
BI31-007	Cadmium	0	0.5	0.06	1.61	34.00	962	-	mg/kg
BI31-007	Chromium	0	0.5	0.15	16.99	39.00	268	-	mg/kg
BI31-007	Copper	0	0.5	0.05	18.06	240.00	40900	-	mg/kg
BI31-007	**Lead**	**0**	**0.5**	**0.26**	**54.62**	**220.00**	**1000**	**25.6**	**mg/kg**
BI31-007	Lithium	0	0.5	0.48	11.55	16.00	20400	-	mg/kg
BI31-007	Nickel	0	0.5	0.19	14.91	28.00	20400	-	mg/kg
BI31-007	Plutonium-239/240	0	0.5	0.65	0.07	4.36	50	3800	pCi/g

Location	Analyte	SBD (ft)	SED (ft)	DL	Background Mean + 2 SD	Result	WRW Action Level	Ecological Receptor Action Level	Unit
BI31-007	Toluene	0	0.5	6.00	N/A	3.80	31300000	128000	ug/kg
BI31-007	**Uranium, Total**	**0**	**0.5**	**1.40**	**5.98**	**110.00**	**2750**	**67.8**	**mg/kg**
BI31-007	Uranium-234	0	0.5	0.33	2.25	2.39	300	1800	pCi/g
BI31-007	Uranium-234	0	0.5	2.01	2.25	28.35	300	1800	pCi/g
BI31-007	Uranium-238	0	0.5	0.12	2.00	3.84	351	1600	pCi/g
BI31-007	Xylene	0	0.5	12.00	N/A	3.70	2040000	-	ug/kg
BI31-007	Zinc	0	0.5	0.45	73.76	1000.00	307000	-	mg/kg
BI31-008	Aluminum	0	0.5	5.30	16902.00	25000.00	228000	-	mg/kg
BI31-008	Beryllium	0	0.5	0.11	0.97	0.99	921	2.15	mg/kg
BI31-008	Chromium	0	0.5	0.16	16.99	19.00	268	-	mg/kg
BI31-008	Lithium	0	0.5	0.53	11.55	19.00	20400	-	mg/kg
BI31-008	Manganese	0	0.5	0.19	365.08	450.00	3480	-	mg/kg
BI31-008	Naphthalene	0	0.5	5.79	N/A	0.95	3090000	-	ug/kg
BI31-008	Nickel	0	0.5	0.21	14.91	21.00	20400	-	mg/kg
BI31-008	Strontium	0	0.5	0.06	48.94	50.00	613000	-	mg/kg
BI31-008	Toluene	0	0.5	5.79	N/A	2.90	31300000	128000	ug/kg
BI31-008	Uranium, Total	0	0.5	4.92	5.98	13.17	2750	67.8	mg/kg
BI31-008	Uranium-234	0	0.5	1.66	2.25	4.44	300	1800	pCi/g
BI31-008	Uranium-235	0	0.5	0.15	0.09	0.23	8	1900	pCi/g
BI31-008	Uranium-238	0	0.5	1.66	2.00	4.44	351	1600	pCi/g
BI31-009	Acetone	0.5	1.5	108.00	N/A	14.00	102000000	211000	ug/kg
BI31-009	Toluene	0.5	1.5	5.39	N/A	2.60	31300000	128000	ug/kg
BI31-009	Uranium, Total	0.5	1.5	5.88	3.04	16.85	2750	67.8	mg/kg
BI31-009	Uranium-234	0.5	1.5	1.98	2.64	5.68	300	1800	pCi/g
BI31-009	Uranium-235	0.5	1.5	0.11	0.12	0.15	8	1900	pCi/g
BI31-009	Uranium-238	0.5	1.5	1.98	1.49	5.68	351	1600	pCi/g
BI31-009-01	Aluminum	0	0.5	5.40	16902.00	30000.00	228000	-	mg/kg
BI31-009-01	Beryllium	0	0.5	0.11	0.97	1.10	921	2.15	mg/kg
BI31-009-01	Chromium	0	0.5	0.17	16.99	22.00	268	-	mg/kg
BI31-009-01	Iron	0	0.5	1.50	18037.00	20000.00	307000	-	mg/kg

Location	Analyte	SBD (ft)	SED (ft)	DL	Background Mean + 2 SD	Result	WRW Action Level	Ecological Receptor Action Level	Unit
BI31-009-01	Lithium	0	0.5	0.54	11.55	20.00	20400	-	mg/kg
BI31-009-01	Nickel	0	0.5	0.21	14.91	21.00	20400	-	mg/kg
BI31-009-01	Strontium	0	0.5	0.06	48.94	49.00	613000	-	mg/kg
BI31-009-01	Uranium, Total	0	0.5	4.93	5.98	13.21	2750	67.8	mg/kg
BI31-009-01	Uranium-234	0	0.5	1.66	2.25	4.45	300	1800	pCi/g
BI31-009-01	Uranium-235	0	0.5	0.15	0.09	0.18	8	1900	pCi/g
BI31-009-01	Uranium-238	0	0.5	1.66	2.00	4.45	351	1600	pCi/g
BI31-009-01	Vanadium	0	0.5	0.51	45.59	48.00	7150	433	mg/kg
BI31-010	Aluminum	0	0.5	5.10	16902.00	19000.00	228000	-	mg/kg
BI31-010	Antimony	0	0.5	0.30	0.47	0.53	409	-	mg/kg
BI31-010	Benzene	0	0.5	5.47	N/A	1.20	205000	-	ug/kg
BI31-010	Cadmium	0	0.5	0.07	1.61	1.80	962	-	mg/kg
BI31-010	Chromium	0	0.5	0.16	16.99	22.00	268	-	mg/kg
BI31-010	Copper	0	0.5	0.05	18.06	46.00	40900	-	mg/kg
BI31-010	Mercury	0	0.5	0.00	0.13	0.28	25200	-	mg/kg
BI31-010	Nickel	0	0.5	0.20	14.91	21.00	20400	-	mg/kg
BI31-010	Toluene	0	0.5	5.47	N/A	3.40	31300000	128000	ug/kg
BI31-010	Uranium, Total	0	0.5	1.50	5.98	11.00	2750	67.8	mg/kg
BI31-010	Uranium-234	0	0.5	2.16	2.25	3.30	300	1800	pCi/g
BI31-010	Uranium-235	0	0.5	0.12	0.09	0.21	8	1900	pCi/g
BI31-010	Uranium-238	0	0.5	2.16	2.00	3.30	351	1600	pCi/g
BI31-010	Zinc	0	0.5	0.48	73.76	74.00	307000	-	mg/kg
BI31-011	Aluminum	0	0.5	5.10	16902.00	18000.00	228000	-	mg/kg
BI31-011	Antimony	0	0.5	0.30	0.47	2.90	409	-	mg/kg
BI31-011	Barium	0	0.5	0.39	141.26	210.00	26400	-	mg/kg
BI31-011	Benzene	0	0.5	5.58	N/A	1.10	205000	-	ug/kg
BI31-011	**Beryllium**	**0**	**0.5**	**0.11**	**0.97**	**4.40**	**921**	**2.15**	**mg/kg**
BI31-011	Cadmium	0	0.5	0.07	1.61	30.00	962	-	mg/kg
BI31-011	Chromium	0	0.5	0.16	16.99	61.00	268	-	mg/kg
BI31-011	Copper	0	0.5	0.05	18.06	330.00	40900	-	mg/kg

Location	Analyte	SBD (ft)	SED (ft)	DL	Background Mean + 2 SD	Result	WRW Action Level	Ecological Receptor Action Level	Unit
BI31-011	**Lead**	**0**	**0.5**	**0.29**	**54.62**	**220.00**	**1000**	**25.6**	**mg/kg**
BI31-011	Naphthalene	0	0.5	5.58	N/A	1.50	3090000	-	ug/kg
BI31-011	Nickel	0	0.5	0.21	14.91	48.00	20400	-	mg/kg
BI31-011	Tin	0	0.5	0.89	2.90	14.00	613000	-	mg/kg
BI31-011	Toluene	0	0.5	5.58	N/A	3.20	31300000	128000	ug/kg
BI31-011	**Uranium, Total**	**0**	**0.5**	**1.50**	**5.98**	**85.00**	**2750**	**67.8**	**mg/kg**
BI31-011	Uranium-234	0	0.5	1.77	2.25	11.16	300	1800	pCi/g
BI31-011	Uranium-235	0	0.5	0.14	0.09	0.33	8	1900	pCi/g
BI31-011	Uranium-238	0	0.5	1.77	2.00	11.16	351	1600	pCi/g
BI31-011	Xylene	0	0.5	11.20	N/A	2.90	2040000	-	ug/kg
BI31-011	Zinc	0	0.5	0.48	73.76	650.00	307000	-	mg/kg
BI31-015	Acetone	0	0.5	5.40	N/A	11.00	102000000	211000	ug/kg
BI31-015	Uranium-235	0	0.5	0.12	0.09	0.16	8	1900	pCi/g
BI31-016	1,2,4-Trichlorobenzene	0	0.5	0.75	N/A	0.95	9230000	-	ug/kg
BI31-016	Acetone	0	0.5	4.80	N/A	5.80	102000000	211000	ug/kg
BI31-016	Methylene chloride	0	0.5	0.84	N/A	0.95	2530000	39500	ug/kg
BI31-016	Naphthalene	0	0.5	0.91	N/A	2.20	3090000	-	ug/kg
BI31-016	Tetrachloroethene	0	0.5	1.00	N/A	1.00	615000	37500	ug/kg
BI31-016	Uranium, Total	0	0.5	6.09	5.98	12.28	2750	67.8	mg/kg
BI31-016	Uranium-234	0	0.5	2.05	2.25	4.14	300	1800	pCi/g
BI31-016	Uranium-235	0	0.5	0.15	0.09	0.25	8	1900	pCi/g
BI31-016	Uranium-238	0	0.5	2.05	2.00	4.14	351	1600	pCi/g
BJ30-000	Barium	0	0.5	98.00	141.26	699.00	26400	-	mg/kg
BJ30-000	Chromium	0	0.5	20.00	16.99	37.80	268	-	mg/kg
BJ30-000	Copper	0	0.5	4.00	18.06	81.30	40900	-	mg/kg
BJ30-000	Iron	0	0.5	2190.00	18037.00	29700.00	307000	-	mg/kg
BJ30-000	**Lead**	**0**	**0.5**	**7.00**	**54.62**	**65.90**	**1000**	**25.6**	**mg/kg**
BJ30-000	Manganese	0	0.5	158.00	365.08	485.00	3480	-	mg/kg
BJ30-000	Nickel	0	0.5	12.00	14.91	34.80	20400	-	mg/kg
BJ30-000	Strontium	0	0.5	20.00	48.94	235.00	613000	-	mg/kg

Location	Analyte	SBD (ft)	SED (ft)	DL	Background Mean + 2 SD	Result	WRW Action Level	Ecological Receptor Action Level	Unit
BJ30-000	Tin	0	0.5	4.00	2.90	4.29	613000	-	mg/kg
BJ30-000	Uranium, Total	0	0.5	5.71	5.98	29.70	2750	67.8	mg/kg
BJ30-000	Uranium-234	0	0.5	1.92	2.25	10.00	300	1800	pCi/g
BJ30-000	Uranium-235	0	0.5	0.20	0.09	0.31	8	1900	pCi/g
BJ30-000	Uranium-238	0	0.5	1.92	2.00	10.00	351	1600	pCi/g
BJ30-000	Vanadium	0	0.5	31.00	45.59	145.00	7150	433	mg/kg
BJ30-000	Zinc	0	0.5	9.00	73.76	133.00	307000	-	mg/kg
BJ31-000	Antimony	0	0.5	7.00	0.47	7.25	409	-	mg/kg
BJ31-000	Barium	0	0.5	98.00	141.26	669.00	26400	-	mg/kg
BJ31-000	Cadmium	0	0.5	3.00	1.61	3.29	962	-	mg/kg
BJ31-000	Chromium	0	0.5	20.00	16.99	46.10	268	-	mg/kg
BJ31-000	Copper	0	0.5	4.00	18.06	78.60	40900	-	mg/kg
BJ31-000	Iron	0	0.5	2190.00	18037.00	30900.00	307000	-	mg/kg
BJ31-000	Lead	0	0.5	7.00	54.62	53.70	1000	25.6	mg/kg
BJ31-000	Manganese	0	0.5	158.00	365.08	655.00	3480	-	mg/kg
BJ31-000	Nickel	0	0.5	12.00	14.91	32.30	20400	-	mg/kg
BJ31-000	Selenium	0	0.5	1.00	1.22	2.06	5110	-	mg/kg
BJ31-000	Strontium	0	0.5	20.00	48.94	271.00	613000	-	mg/kg
BJ31-000	Tin	0	0.5	4.00	2.90	5.29	613000	-	mg/kg
BJ31-000	Uranium, Total	0	0.5	5.61	5.98	14.85	2750	67.8	mg/kg
BJ31-000	Uranium-234	0	0.5	1.89	2.25	5.00	300	1800	pCi/g
BJ31-000	Uranium-238	0	0.5	1.89	2.00	5.00	351	1600	pCi/g
BJ31-000	Vanadium	0	0.5	31.00	45.59	84.90	7150	433	mg/kg
BJ31-000	Zinc	0	0.5	9.00	73.76	196.00	307000	-	mg/kg
BJ31-001	Barium	0	0.5	98.00	141.26	719.00	26400	-	mg/kg
BJ31-001	Chromium	0	0.5	20.00	16.99	35.60	268	-	mg/kg
BJ31-001	Copper	0	0.5	4.00	18.06	70.30	40900	-	mg/kg
BJ31-001	Iron	0	0.5	2190.00	18037.00	33900.00	307000	-	mg/kg
BJ31-001	**Lead**	**0**	**0.5**	**7.00**	**54.62**	**49.50**	**1000**	**25.6**	**mg/kg**
BJ31-001	Manganese	0	0.5	158.00	365.08	578.00	3480	-	mg/kg

Location	Analyte	SBD (ft)	SED (ft)	DL	Background Mean + 2 SD	Result	WRW Action Level	Ecological Receptor Action Level	Unit
BJ31-001	Nickel	0	0.5	12.00	14.91	35.10	20400	-	mg/kg
BJ31-001	Strontium	0	0.5	20.00	48.94	197.00	613000	-	mg/kg
BJ31-001	Uranium, Total	0	0.5	5.23	5.98	17.82	2750	67.8	mg/kg
BJ31-001	Uranium-234	0	0.5	1.76	2.25	6.00	300	1800	pCi/g
BJ31-001	Uranium-235	0	0.5	0.20	0.09	0.40	8	1900	pCi/g
BJ31-001	Uranium-238	0	0.5	1.76	2.00	6.00	351	1600	pCi/g
BJ31-001	Vanadium	0	0.5	31.00	45.59	84.10	7150	433	mg/kg
BJ31-001	Zinc	0	0.5	9.00	73.76	113.00	307000	-	mg/kg
BJ31-002	Barium	0	0.5	98.00	141.26	558.00	26400	-	mg/kg
BJ31-002	Chromium	0	0.5	20.00	16.99	31.00	268	-	mg/kg
BJ31-002	Copper	0	0.5	4.00	18.06	90.10	40900	-	mg/kg
BJ31-002	Iron	0	0.5	2190.00	18037.00	33300.00	307000	-	mg/kg
BJ31-002	**Lead**	**0**	**0.5**	**7.00**	**54.62**	**61.90**	**1000**	**25.6**	**mg/kg**
BJ31-002	Manganese	0	0.5	158.00	365.08	689.00	3480	-	mg/kg
BJ31-002	Nickel	0	0.5	12.00	14.91	36.90	20400	-	mg/kg
BJ31-002	Strontium	0	0.5	20.00	48.94	273.00	613000	-	mg/kg
BJ31-002	Uranium, Total	0	0.5	6.71	5.98	9.15	2750	67.8	mg/kg
BJ31-002	Uranium-234	0	0.5	2.26	2.25	3.00	300	1800	pCi/g
BJ31-002	Uranium-235	0	0.5	0.16	0.09	0.30	8	1900	pCi/g
BJ31-002	Uranium-238	0	0.5	2.26	2.00	3.00	351	1600	pCi/g
BJ31-002	Vanadium	0	0.5	31.00	45.59	121.00	7150	433	mg/kg
BJ31-002	Zinc	0	0.5	9.00	73.76	189.00	307000	-	mg/kg
BJ31-003	Barium	0	0.5	98.00	141.26	688.00	26400	-	mg/kg
BJ31-003	Chromium	0	0.5	20.00	16.99	47.80	268	-	mg/kg
BJ31-003	Copper	0	0.5	4.00	18.06	54.40	40900	-	mg/kg
BJ31-003	Iron	0	0.5	2190.00	18037.00	36500.00	307000	-	mg/kg
BJ31-003	**Lead**	**0**	**0.5**	**7.00**	**54.62**	**58.60**	**1000**	**25.6**	**mg/kg**
BJ31-003	Manganese	0	0.5	158.00	365.08	569.00	3480	-	mg/kg
BJ31-003	Nickel	0	0.5	12.00	14.91	43.70	20400	-	mg/kg
BJ31-003	Strontium	0	0.5	20.00	48.94	250.00	613000	-	mg/kg

Location	Analyte	SBD (ft)	SED (ft)	DL	Background Mean + 2 SD	Result	WRW Action Level	Ecological Receptor Action Level	Unit
BJ31-003	Uranium, Total	0	0.5	5.44	5.98	17.82	2750	67.8	mg/kg
BJ31-003	Uranium-234	0	0.5	1.83	2.25	6.00	300	1800	pCi/g
BJ31-003	Uranium-235	0	0.5	0.18	0.09	0.30	8	1900	pCi/g
BJ31-003	Uranium-238	0	0.5	1.83	2.00	6.00	351	1600	pCi/g
BJ31-003	Vanadium	0	0.5	31.00	45.59	130.00	7150	433	mg/kg
BJ31-003	Zinc	0	0.5	9.00	73.76	151.00	307000	-	mg/kg
BJ31-004	Barium	0	0.5	98.00	141.26	745.00	26400	-	mg/kg
BJ31-004	Chromium	0	0.5	20.00	16.99	56.90	268	-	mg/kg
BJ31-004	Copper	0	0.5	4.00	18.06	95.40	40900	-	mg/kg
BJ31-004	Iron	0	0.5	2190.00	18037.00	36700.00	307000	-	mg/kg
BJ31-004	**Lead**	**0**	**0.5**	**7.00**	**54.62**	**30.50**	**1000**	**25.6**	**mg/kg**
BJ31-004	Manganese	0	0.5	158.00	365.08	513.00	3480	-	mg/kg
BJ31-004	Nickel	0	0.5	12.00	14.91	39.90	20400	-	mg/kg
BJ31-004	Strontium	0	0.5	20.00	48.94	232.00	613000	-	mg/kg
BJ31-004	Tin	0	0.5	4.00	2.90	4.21	613000	-	mg/kg
BJ31-004	Uranium, Total	0	0.5	6.39	5.98	11.88	2750	67.8	mg/kg
BJ31-004	Uranium-234	0	0.5	2.15	2.25	4.00	300	1800	pCi/g
BJ31-004	Uranium-235	0	0.5	0.17	0.09	0.30	8	1900	pCi/g
BJ31-004	Uranium-238	0	0.5	2.15	2.00	4.00	351	1600	pCi/g
BJ31-004	Vanadium	0	0.5	31.00	45.59	112.00	7150	433	mg/kg
BJ31-004	Zinc	0	0.5	9.00	73.76	114.00	307000	-	mg/kg
BJ32-000	Antimony	0	0.5	7.00	0.47	7.29	409	-	mg/kg
BJ32-000	Arsenic	0	0.5	5.00	10.09	12.90	22.2	21.6	mg/kg
BJ32-000	Barium	0	0.5	98.00	141.26	836.00	26400	-	mg/kg
BJ32-000	Chromium	0	0.5	20.00	16.99	43.30	268	-	mg/kg
BJ32-000	Copper	0	0.5	4.00	18.06	55.50	40900	-	mg/kg
BJ32-000	Iron	0	0.5	2190.00	18037.00	29100.00	307000	-	mg/kg
BJ32-000	**Lead**	**0**	**0.5**	**7.00**	**54.62**	**82.10**	**1000**	**25.6**	**mg/kg**
BJ32-000	Manganese	0	0.5	158.00	365.08	567.00	3480	-	mg/kg
BJ32-000	Nickel	0	0.5	12.00	14.91	33.70	20400	-	mg/kg

Location	Analyte	SBD (ft)	SED (ft)	DL	Background Mean + 2 SD	Result	WRW Action Level	Ecological Receptor Action Level	Unit
BJ32-000	Strontium	0	0.5	20.00	48.94	250.00	613000	-	mg/kg
BJ32-000	Tin	0	0.5	4.00	2.90	6.99	613000	-	mg/kg
BJ32-000	Uranium, Total	0	0.5	5.73	5.98	21.68	2750	67.8	mg/kg
BJ32-000	Uranium-234	0	0.5	1.93	2.25	7.30	300	1800	pCi/g
BJ32-000	Uranium-238	0	0.5	1.93	2.00	7.30	351	1600	pCi/g
BJ32-000	Vanadium	0	0.5	31.00	45.59	122.00	7150	433	mg/kg
BJ32-000	Zinc	0	0.5	9.00	73.76	134.00	307000	-	mg/kg
BL32-000	Arsenic	0	0.5	5.00	10.09	13.70	22.2	21.6	mg/kg
BL32-000	Barium	0	0.5	98.00	141.26	798.00	26400	-	mg/kg
BL32-000	Chromium	0	0.5	20.00	16.99	30.70	268	-	mg/kg
BL32-000	Copper	0	0.5	4.00	18.06	39.60	40900	-	mg/kg
BL32-000	Iron	0	0.5	2190.00	18037.00	28000.00	307000	-	mg/kg
BL32-000	**Lead**	**0**	**0.5**	**7.00**	**54.62**	**82.00**	**1000**	**25.6**	**mg/kg**
BL32-000	Manganese	0	0.5	158.00	365.08	594.00	3480	-	mg/kg
BL32-000	Nickel	0	0.5	12.00	14.91	32.80	20400	-	mg/kg
BL32-000	Strontium	0	0.5	20.00	48.94	206.00	613000	-	mg/kg
BL32-000	Tin	0	0.5	4.00	2.90	4.18	613000	-	mg/kg
BL32-000	Uranium, Total	0	0.5	5.09	5.98	15.44	2750	67.8	mg/kg
BL32-000	Uranium-234	0	0.5	1.71	2.25	5.20	300	1800	pCi/g
BL32-000	Uranium-238	0	0.5	1.71	2.00	5.20	351	1600	pCi/g
BL32-000	Vanadium	0	0.5	31.00	45.59	152.00	7150	433	mg/kg
BL32-000	Zinc	0	0.5	9.00	73.76	108.00	307000	-	mg/kg
BM31-000	Barium	0	0.5	98.00	141.26	627.00	26400	-	mg/kg
BM31-000	Chromium	0	0.5	20.00	16.99	33.60	268	-	mg/kg
BM31-000	Copper	0	0.5	4.00	18.06	58.90	40900	-	mg/kg
BM31-000	Iron	0	0.5	2190.00	18037.00	25300.00	307000	-	mg/kg
BM31-000	**Lead**	**0**	**0.5**	**7.00**	**54.62**	**87.00**	**1000**	**25.6**	**mg/kg**
BM31-000	Manganese	0	0.5	158.00	365.08	649.00	3480	-	mg/kg
BM31-000	Nickel	0	0.5	12.00	14.91	26.10	20400	-	mg/kg
BM31-000	Strontium	0	0.5	20.00	48.94	183.00	613000	-	mg/kg

Location	Analyte	SBD (ft)	SED (ft)	DL	Background Mean + 2 SD	Result	WRW Action Level	Ecological Receptor Action Level	Unit
BM31-000	Tin	0	0.5	4.00	2.90	7.53	613000	-	mg/kg
BM31-000	Uranium, Total	0	0.5	3.95	5.98	8.32	2750	67.8	mg/kg
BM31-000	Uranium-234	0	0.5	1.33	2.25	2.80	300	1800	pCi/g
BM31-000	Uranium-235	0	0.5	0.17	0.09	0.28	8	1900	pCi/g
BM31-000	Uranium-238	0	0.5	1.33	2.00	2.80	351	1600	pCi/g
BM31-000	Vanadium	0	0.5	31.00	45.59	112.00	7150	433	mg/kg
BM31-000	Zinc	0	0.5	9.00	73.76	169.00	307000	-	mg/kg
BM31-001	Barium	0	0.5	98.00	141.26	556.00	26400	-	mg/kg
BM31-001	Chromium	0	0.5	20.00	16.99	46.40	268	-	mg/kg
BM31-001	Copper	0	0.5	4.00	18.06	32.20	40900	-	mg/kg
BM31-001	Iron	0	0.5	2190.00	18037.00	26300.00	307000	-	mg/kg
BM31-001	**Lead**	**0**	**0.5**	**7.00**	**54.62**	**44.10**	**1000**	**25.6**	**mg/kg**
BM31-001	Manganese	0	0.5	158.00	365.08	596.00	3480	-	mg/kg
BM31-001	Nickel	0	0.5	12.00	14.91	30.00	20400	-	mg/kg
BM31-001	Strontium	0	0.5	20.00	48.94	180.00	613000	-	mg/kg
BM31-001	Tin	0	0.5	4.00	2.90	4.75	613000	-	mg/kg
BM31-001	Uranium, Total	0	0.5	6.47	5.98	19.31	2750	67.8	mg/kg
BM31-001	Uranium-234	0	0.5	2.18	2.25	6.50	300	1800	pCi/g
BM31-001	Uranium-235	0	0.5	0.22	0.09	0.44	8	1900	pCi/g
BM31-001	Uranium-238	0	0.5	2.18	2.00	6.50	351	1600	pCi/g
BM31-001	Vanadium	0	0.5	31.00	45.59	167.00	7150	433	mg/kg
BM31-001	Zinc	0	0.5	9.00	73.76	109.00	307000	-	mg/kg
BM31-002	Arsenic	0	0.5	5.00	10.09	10.70	22.2	21.6	mg/kg
BM31-002	Barium	0	0.5	98.00	141.26	727.00	26400	-	mg/kg
BM31-002	Chromium	0	0.5	20.00	16.99	35.90	268	-	mg/kg
BM31-002	Copper	0	0.5	4.00	18.06	66.80	40900	-	mg/kg
BM31-002	Iron	0	0.5	2190.00	18037.00	31800.00	307000	-	mg/kg
BM31-002	**Lead**	**0**	**0.5**	**7.00**	**54.62**	**87.80**	**1000**	**25.6**	**mg/kg**
BM31-002	Manganese	0	0.5	158.00	365.08	736.00	3480	-	mg/kg
BM31-002	Nickel	0	0.5	12.00	14.91	40.90	20400	-	mg/kg

Location	Analyte	SBD (ft)	SED (ft)	DL	Background Mean + 2 SD	Result	WRW Action Level	Ecological Receptor Action Level	Unit
BM31-002	Selenium	0	0.5	1.00	1.22	1.71	5110	-	mg/kg
BM31-002	Strontium	0	0.5	20.00	48.94	213.00	613000	-	mg/kg
BM31-002	Uranium, Total	0	0.5	14.71	5.98	16.34	2750	67.8	mg/kg
BM31-002	Uranium-234	0	0.5	4.95	2.25	5.50	300	1800	pCi/g
BM31-002	Uranium-235	0	0.5	0.31	0.09	0.33	8	1900	pCi/g
BM31-002	Uranium-238	0	0.5	4.95	2.00	5.50	351	1600	pCi/g
BM31-002	Vanadium	0	0.5	31.00	45.59	186.00	7150	433	mg/kg
BM31-002	Zinc	0	0.5	9.00	73.76	406.00	307000	-	mg/kg
BN33-000	Arsenic	0	0.5	5.00	10.09	15.70	22.2	21.6	mg/kg
BN33-000	Barium	0	0.5	98.00	141.26	766.00	26400	-	mg/kg
BN33-000	Chromium	0	0.5	20.00	16.99	37.10	268	-	mg/kg
BN33-000	Copper	0	0.5	4.00	18.06	59.80	40900	-	mg/kg
BN33-000	Iron	0	0.5	2190.00	18037.00	35200.00	307000	-	mg/kg
BN33-000	**Lead**	**0**	**0.5**	**7.00**	**54.62**	**47.40**	**1000**	**25.6**	**mg/kg**
BN33-000	Manganese	0	0.5	158.00	365.08	458.00	3480	-	mg/kg
BN33-000	Nickel	0	0.5	12.00	14.91	48.50	20400	-	mg/kg
BN33-000	Strontium	0	0.5	20.00	48.94	175.00	613000	-	mg/kg
BN33-000	Uranium, Total	0	0.5	4.64	5.98	10.99	2750	67.8	mg/kg
BN33-000	Uranium-234	0	0.5	1.56	2.25	3.70	300	1800	pCi/g
BN33-000	Uranium-238	0	0.5	1.56	2.00	3.70	351	1600	pCi/g
BN33-000	Vanadium	0	0.5	31.00	45.59	167.00	7150	433	mg/kg
BN33-000	Zinc	0	0.5	9.00	73.76	90.30	307000	-	mg/kg
INCINERATOR-EAST	Uranium, Total	0	0.3	6.57	5.98	15.30	2750	67.8	mg/kg
INCINERATOR-EAST	Uranium-234	0	0.3	2.21	2.25	5.15	300	1800	pCi/g
INCINERATOR-WEST	Uranium, Total	0	0.3	5.17	5.98	16.62	2750	67.8	mg/kg
INCINERATOR-WEST	Uranium-234	0	0.3	0.24	2.25	7.39	300	1800	pCi/g
INCINERATOR-WEST	Uranium-235	0	0.3	0.15	0.09	0.45	8	1900	pCi/g
INCINERATOR-WEST	Uranium-238	0	0.3	0.20	2.00	3.27	351	1600	pCi/g

Seep Summary									
Location	Analyte	SBD (ft)	SBD (ft)	DL	Seep Background	Result	Surface Water Action Level	Stream Background	Unit
SEEP 2	Aluminum	N/A	N/A	0.02	0.26	0.48	0.09	0.03	mg/L
SEEP 1	Aluminum	N/A	N/A	0.02	0.26	0.10	0.09	0.03	mg/L

SBD – Soil Begin Depth
SED – Soil End Depth
DL□ Detection Limit

Bold type denotes AL exceedance.
N/A Not Applicable

2.4 SORs and AOC

RFCA sums of ratios (SORs) were calculated for IHSSs 133.5 and 133.6 sampling locations based on the characterization analytical data for the radionuclides of concern and the WRW ALs. Plutonium-239/240 activities are derived from the americium-241 activities as shown in Equation 2-1. Table 5 presents the SORs for surface and subsurface soil. SORs were calculated for all locations with analytical results greater than background means plus two standard deviations or DLs. All SORs for radionuclides in surface and subsurface soil are less than 1.

Equation 2-1
Pu-239/240 = (Am-241 gamma spectroscopy concentration x 8.08) + 3.24]

Table 5
RFCA SORs Based on Radionuclide Concentrations

Location Code	Surface Soil SOR	Subsurface Soil SOR
BH30-000	0.01	0.06
BI30-000	0.06	No Data
BI30-001	0.08	No Data
BI30-002	0.12	No Data
BI30-003	0.12	No Data
BI31-000	0.02	0.06
BI31-001	0.06	0.05
BI31-002	0.05	0.07
BI31-003	0.06	0.05
BI31-004	0.04	0.03
BI31-005	0.05	No Data
BI31-006	0.05	No Data
BI31-007	0.15	No Data
BI31-008	0.06	No Data
BI31-009-01	0.05	0.05
BI31-009	No Data	0.05
BI31-010	0.05	No Data
BI31-011	0.11	No Data
BI31-015	0.02	No Data
BI31-016	0.06	No Data
BJ30-000	0.10	No Data
BJ31-000	0.03	No Data
BJ31-001	0.09	No Data
BJ31-002	0.06	No Data
BJ31-003	0.07	No Data
BJ31-004	0.06	No Data
BJ32-000	0.05	No Data
BL32-000	0.03	No Data
BM31-000	0.05	No Data
BM31-001	0.10	No Data

Location Code	Surface Soil SOR	Subsurface Soil SOR
BM31-002	0.08	No Data
BN33-000	0.02	No Data
INCINERATOR-EAST	0.02	No Data
INCINERATOR-WEST	0.11	No Data

The Area of Concern (AOC), shown on Figure 4, was determined based on characterization analytical results. The AOC is defined as the area with any contaminant concentration greater than the background means plus two standard deviations or DLs.

3.0 ACCELERATED ACTION

Accelerated action objectives were developed for the Incinerator and Concrete Wash Pad, and are described in ER RSOP Notification #03-09 (DOE 2003c). ER RSOP remedial action objectives (RAOs) include the following:

- Provide a remedy consistent with the RFETS goal of protection of human health and the environment;
- Provide a remedy that minimizes the need for long-term maintenance and institutional or engineering controls; and
- Minimize the spread of contaminants during implementation of accelerated actions.
- The accelerated action remediation goals for the Incinerator included the following:
- Remove the Incinerator and recycle in accordance with the RSOP for Recycling Concrete (DOE 2003d) or dispose at an appropriate facility. The concrete wing walls and footings were anticipated to be left in place unless they had to be removed to remove the Incinerator.
- Remove soil with non radionuclide or uranium contaminant concentrations greater than the RFCA WRW ALs to a depth of 6 inches. If soil contamination greater than ALs extends 6 inches in depth, perform an SSRS.
- Consult with the regulatory agencies if contaminant concentrations are greater than the ecological receptor ALs but less than the WRW ALs.
- If contaminated soil is removed, collect soil samples in accordance with the BZSAP (DOE 2002a).

Accelerated action activities were conducted between April 24, 2003, and November 17, 2003. The area is scheduled to be reseeded in December 2003. Start and end dates of significant activities are listed in Table 6. Key components removed during the accelerated action are shown on Figure 5. Photographs of site activities are provided in Appendix A.

Table 6
Dates of Accelerated Action Activities for IHSS 133.5

Activity	Start Date	End Date	Duration
Characterization Sampling	April 24, 2003	November 17, 2003	203 Days
Removal Activities	October 28, 2003	November 12, 2003	16 Days
Backfill Excavations	November 12, 2003	November 14, 2003	3 Days
Reseed	December 2003[a]	December 2003	1 Day

[a] Planned activity not performed to date.

3.1 Removal Activities

All accelerated action objectives were achieved. Removal activities are described below.

ER RSOP Notification #03-09 (DOE 2003c) accelerated action project objectives for IHSS 133.5 were achieved through the following:

- The IHSS 133.5 Incinerator was removed.
- Soot-covered concrete rubble, concrete slabs, potential asbestos–containing material (ACM), two drum carcasses, and ash-like material mixed with clean fill were removed and disposed as LLW.
- Low-level radioactive (LLW) and low-level radioactive mixed hazardous waste (LLMW) wereremoved.
- ACM was removed.
- Clean soil was removed from the Incinerator.
- Characterization samples were collected in accordance with the BZSAP (DOE 2002a) to verify that contaminant of concern (COC) concentrations were less than the WRW ALs.

These removal activities are described below.

3.1.1 Removal of Concrete Slabs from the Concrete Wash Area

Clean concrete was removed from the Concrete Wash Area as a best management practice (BMP). This removal action was not considered an accelerated action because the concrete was not contaminated. The concrete, which was up to 5 feet thick, in some places, was broken up using a hydraulic hammer and was recycled in accordance with the RSOP for Recycling Concrete (DOE 2003d). The concrete pieces were turned over and surveyed to determine whether radionuclide contamination was present. Approximately 3,000 cubic yards (cy) of concrete debris was taken from the adjacent area and sent to the Building 850 recycle pile. Concrete disposal is described in Section 10.0. Soil samples were collected after removal of the excess concrete to characterize the IHSS.

3.1.2 Removal of Incinerator Structure: Spring 2003 Activities

On April 24, 2003, during concrete removal at IHSS 133.5, the southern face of the Incinerator was exposed enough to be identified. The Incinerator was hidden by backfill along the northern, eastern and western sides of the structure. The roof of the Incinerator had been buried by approximately 1 foot of soil, and approximately one-half of the roof area was exposed. Field radiological surveys of part of the outside surfaces of the Incinerator and the equipment were less than the free-release criteria of 1,000 disentegrations per 100 square per minute per centimeters (dpm/100 cm^2) (removable).

Additional radiological surveys of the exposed Incinerator sides and roof were performed on April 26, 2003. A slightly elevated area was found on the roof near the former location of the Incinerator stack. Activities at this area were detectable but well below the free-release criteria of 1,000 dpm/100 cm^2 (removable).

ACM covering the roof of the Incinerator was encountered during excavation activities. Sampling and analysis confirmed that the roofing material contained 20 percent ACM. This material was deemed to be LLW and is being prepared for off-site shipment.

Laboratory debris with elevated beta radiation was discovered approximately 250 feet south of the Incinerator on May 1, 2003. The HRR for the area states that noncombustible glassware and trash were collected in a nearby dumpster, thus this type of material was not unexpected. The immediate area where the trash was found was posted as a radioactive material area, and the material was removed and disposed of as waste. The lab debris was bagged and placed into two strong-tight metal boxes. One box was classified as LLW, and the second container was classified as mixed LLW/hazardous waste. Both waste containers were prepared for offsite shipment.

Removal activities were postponed in May 2003 to evaluate the acquired data and develop a comprehensive plan to dispose of the Incinerator (DOE 2003c).

3.1.3 Removal of Incinerator Structure: Fall 2003 Activities

Removal of the Incinerator resumed on October 24, 2003. The Incinerator roof, walls, and wing walls were removed and broken into pieces using a Hitachi 330LC. The foundation slabs were broken up using a hydraulic hammer. During removal activities, soot-covered concrete rubble was found at an approximate depth of 2.5 feet. Additional concrete slabs below the Incinerator roof were broken up and disposed as LLW. Two drum carcasses were found at the base of the Incinerator. The carcasses were disposed of as LLW along with the concrete.

Rebar, refractory metal, and some metal debris were also associated with the Incinerator concrete but were not segregated from the concrete. A total of 108 cy of this material was classified as LLMW and is currently being stored pending shipment. Final disposition is pending waste characterization results. Approximately 15 cy of sanitary waste was generated. In addition, approximately 90 cy of uncontaminated concrete rubble from the area surrounding the Incinerator was sent to the Building 850 recycle pile.

Three concrete structures remain: the footer under the northern wall, and the two caissons that were located under the Incinerator where the southern wing walls joined this structure. None of these remaining structures were in contact with ash, and all are greater than 3 feet below grade after final regrading.

During removal of the contaminated concrete located south of the Incinerator in November 2003, a small area with broken glass and other small debris was discovered along with some ash-like material. Elevated radiological counts were associated with both the ash and debris. This material was removed from the area and placed in a waste container for shipment off-site. A radiological survey of the soil after removal of ash and debris indicated that all contaminated material had been removed. A sample was collected from the remaining soil after the removal of ash and debris and analyzed for metals. The results verified no AL exceedances.

3.1.4 Soil Remediation and Site Reclamation

Soil within excavations was sampled and analytical results indicated that contaminant concentrations in soil were less than RFCA WRW ALs (Section 2.3). Therefore, no soil was removed. Excavations were backfilled, and the area was graded and will be seeded (Section 11.0). Documentation regarding approval to backfill is provided in an ER Regulatory Contact Record dated November 12, 2003 (Appendix B). Approximately 100 cy of Rocky Flats Alluvium was brought from the (unused) New Landfill area to the project site.

4.0 CONFIRMATION SAMPLING

Because results from accelerated action sampling indicate that contaminant concentrations were less than the RFCA WRW ALs, no soil was removed, and confirmation sampling was not conducted.

5.0 RCRA UNIT CLOSURE

The Incinerator was never regulated under the Resource Conservation and Recovery Act (RCRA), and, therefore, IHSSs 133.5 and 133.6 are not subject to RCRA closure requirements.

6.0 SSRS

Current site conditions were evaluated to determine whether remediation is required by the SSRS outlined in Figure 3 of Attachment 5 of the RFCA Modifications (DOE et al. 2003).

Screen 1 – Are COC concentrations below Table 3 soil ALs for the WRW?

Available analytical data, collected before and after Incinerator and soil removal, for radionuclides, metals, and volatile organic compounds (VOCs) indicate that these COC concentrations are below WRW ALs.

Screen 2 – Is there a potential for subsurface soil to become surface soil (landslide and erosion areas identified on Figure 1)?

IHSS 133.5 is located in an area prone to landslides and high erosion as identified on Attachment 5 - Figure 1 of the RFCA Modifications. However, current data do not indicate analytical results above WRW ALs (DOE et al. 2003). The excavation resulting from the Incinerator removal was backfilled with soil, compacted, and regraded to a slope of 3:1, which should minimize slumping or erosion.

Screen 3 – Does subsurface soil contamination for radionuclides exceed criteria defined in Section 5.3 and Attachment 14?

Current characterization data do not indicate that radionuclides (plutonium and americium) exceed their ALs in IHSSs 133.5 and 133.6 as defined in Section 5.3. Attachment 14 pertains to contaminated soil associated with reported or suspected Original Process Waste Lines (OPWL) leaks and associated valve vaults, which does not apply to IHSSs 133.5 and 133.6.

Screen 4 – Is there an environmental pathway and sufficient quantity of COCs that would cause an exceedance of the surface water standards?

Contaminant migration via erosion and groundwater are the two possible pathways whereby surface water could become contaminated from IHSS Group SW-1. Contaminant concentrations were reduced by the removal of the Incinerator and fill within the Incinerator. The nearest surface water is Woman Creek, which is located approximately 400 feet south of IHSS 133.5 (Figure 1). However, the potential for erosion as a pathway is unlikely given that the site has been regraded and will be seeded with native plants and grasses.

Groundwater is another possible pathway whereby surface water could become contaminated by IHSS Group SW-1, thus groundwater data have been assessed. Available analytical data for surface and subsurface soil suggest that uranium is the only contaminant with the potential to migrate to surface water from IHSS Group SW-1 via groundwater.

The nearest downgradient groundwater well (62593) with data is located approximately 150 feet southeast of IHSS 133.5. The most recent sampling data for this well are from July 1993 and May 1995. Analytical results from both sampling events indicate that all uranium isotopes are below RFCA Tier II ALs for groundwater.

Samples were also collected from two seeps (SEEP 1 and SEEP 2) that are located near the Incinerator. Samples were analyzed for radionuclides and metals. No radionuclides were detected above detection limits. However, aluminum was detected slightly above Surface Water ALs at both locations (Table 4).

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In addition, uranium is not a contaminant that exceeds surface water ALs in Woman Creek, and, as such, IHSS 133.5 does not appear to be impacting surface water quality. Furthermore, recent water quality data at downgradient station SW027 (surface water Point of Evaluation [POE]) indicate these contaminants were less than RFCA surface water ALs (DOE 2003e).

Screen 5 – Are COC concentrations below the Table 3 soil ALs for ecological receptors?

Some metals, including lead, beryllium, and total uranium, exceed ecological receptor ALs at several locations (Section 2.3). However, the observed exceedances are only slightly elevated relative to the ecological receptor ALs and, given the regrading and reseeding, potential exposure to ecological receptors should be minimized. Exceedances will be further evaluated in the accelerated action ecological screening process (AAESP).

7.0 STEWARDSHIP ANALYSIS

The IHSSs 133.5 and 133.6 stewardship evaluation was conducted through ongoing consultation with the regulatory agencies. Frequent informal project updates, e-mails, and telephone and personal contact occurred throughout the project. Documentation associated with these contacts is provided in Appendix B.

7.1 Current Site Conditions

As discussed in Section 3.1, accelerated actions at IHSSs 133.5 and 133.6 consisted of excavation of the Incinerator and the miscellaneous concrete south of the Incinerator. Based on the accelerated action, the following conditions exist at IHSSs 133.5 and 133.6:

- Potential sources of contamination that existed in IHSSs 133.5 and 133.6 (that is, the Incinerator and miscellaneous concrete) were removed.
- Surface and subsurface contaminant concentrations in soil are greater than background means plus two standard deviations or DLs throughout IHSSs 133.5 and 133.6.
- Contaminant concentrations are below RFCA WRW ALs. However, samples at several locations exceed ecological receptor ALs for lead, beryllium, and total uranium.
- The site was covered with approximately 6 inches of backfill and will be re-vegetated.

7.2 Near-Term Management Recommendations

Because residual contaminant concentrations are low and potential contaminant sources were removed, mitigated, or found not to have existed, no specific near-term management techniques are required. Potential contaminant sources and pathways have been removed. Contaminant concentrations in soil remaining at IHSSs 133.5 and 133.6 do not trigger any further accelerated action. Near-term recommendations include the following:

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- Excavation at the site will continue to be controlled through the Site Soil Disturbance Permit process.
- Access will be restricted to minimize disturbance to newly revegetated areas.
- Site access and the Soil Disturbance Permit process will remain in place pending implementation of long-term controls.

7.3 Long-Term Stewardship Recommendations

Based on remaining environmental conditions at IHSSs 133.5 and 133.6, no specific long-term stewardship activities are recommended beyond the generally applicable Site requirements. These requirements may be imposed on this area in the future. Institutional controls that will be used as appropriate for this area include the following:

- Restrictions on excavation or other soil disturbance; and
- Prohibitions on groundwater pumping in the area of IHSSs 133.5 and 133.6.

No specific engineered controls or environmental monitoring are recommended as a result of the conditions remaining at IHSSs 133.5 and 133.6. Likewise, no specific institutional or physical controls are recommended as a result of the conditions remaining at IHSSs 133.5 and 133.6.

This Closeout Report and associated documentation will be retained as part of the Rocky Flats Administrative Record (AR) file. The specific long-term stewardship recommendations will also be summarized in the Rocky Flats Long-Term Stewardship Strategy.

IHSSs 133.5 and 133.6 will be evaluated as part of the Sitewide CRA, which is part of the RCRA Facility Investigation/Remedial Investigation (RFI/RI) and corrected Measures Study/Feasibility (CMS/FS) that will be conducted for the Site. The need for and extent of any more general, long-term stewardship activities will also be evaluated in the RFI/RI and CMS/FS and will be proposed as part of the preferred alternative in the Proposed Plan for the Site. Institutional controls and other long-term stewardship requirements for Rocky Flats will ultimately be contained in the Corrective Action Design/Record of Decision (CAD/ROD), any post-closure Colorado Hazardous Waste Act (CHWA) permit that may be required, and any post-RFCA agreement.

8.0 DEVIATIONS FROM THE ER RSOP

Removal methods and objectives did not deviate from ER RSOP Notification #03-09 (DOE 2003c).

9.0 POST-ACCELERATED ACTION CONDITIONS

The Incinerator slab and foundation walls were removed. Sampling results from the soil beneath the items removed indicate that all contaminant concentrations are less than the proposed RFCA WRW ALs. Sampling results from other locations in the IHSSs also indicate that all contaminant concentrations are less than the proposed RFCA WRW ALs.

The presence of residual contamination was determined based on pre accelerated action and accelerated action characterization. Pre accelerated action characterization indicates no contaminant concentrations in surface or subsurface soil greater than the proposed RFCA WRW ALs. Accelerated action characterization indicates no contaminant concentrations in surface or subsurface soil greater than the RFCA WRW ALs. Also, Ecological Receptor AL exceedances of lead, beryllium, and total uranium concentrations in soil were observed at several locations. Residual soil concentrations greater than background means plus two standard deviations or DLs at IHSSs 133.5 and 133.6 are shown on Figure 6.

SORs, based on the RFCA WRW ALs for radionuclides and pre accelerated action and accelerated action data, are listed in Table 5 and shown on Figure 7. Plutonium-239/240 activities are derived from the americium-241 activities as described in Section 2.0. All SORs for radionuclides in surface and subsurface soil were less than 1.

THIS TARGET SHEET REPRESENTS AN OVER-SIZED MAP / PLATE FOR THIS DOCUMENT:
(Ref: 03-RF-01849; JLB-150-03)

Closeout Report for IHSS Group SW-1 (Incinerator)

December 2003

Figure 6:

Residual Contamination at IHSS Group SW-1

File: w:\projects\fy2004\SW-1\SW-1_clrpt_dcr_2.apr

November 2003

CERCLA Administrative Record Document, BZ-Z-000650

U.S. DEPARTEMENT OF ENERGY
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

GOLDEN, COLORADO

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10.0 WASTE MANAGEMENT

Waste derived from the IHSS Group SW-1 accelerated action were disposed in accordance with the RSOP (DOE 2003b). One hundred eighty seven cubic yards of concrete, laboratory debris, and fill material were classified as LLW and placed in intermodal containers. An additional 108 cy of rebar, refractory metal, fill material, and some metal debris were disposed as LLMW. Fifteen cy of concrete was classified as sanitary waste, placed in dump trucks, and shipped to an off-site (Erie) sanitary landfill. Approximately 90 cy of concrete waste was hauled to the concrete recycling pile on the Building 850 slab. Some ACM was removed from the Incinerator roof and was classified as LLW. In addition, approximately 12 cy of clean soil removed from the upper portion of the Incinerator, was used for regrading.

11.0 SITE RECLAMATION

Upon removal of the Incinerator, the final slope of the land surface at and immediately adjacent to the Incinerator was graded to a 3:1 slope using standard earth-moving equipment. This slope is less than the existing slopes of the area surrounding the Incinerator. Erosion from the slopes will be controlled with standard engineering controls, and the slope will also be revegetated according to the existing revegetation plans in December 2003.

Approximately 300 cy of native soil was brought to the project site and spread over the area. The fill material for the excavations created by the removal of the Incinerator consisted of Rocky Flats Alluvium from the New Landfill area. The fill material was placed in approximate18-inch loose lifts and compacted with several passes of equipment weighing approximately 20,000 pounds, which exerted a foot pressure not less than 6 ½ pounds per square inch. Compaction was achieved when no visual deflection of the fill was observed.

The area was subsequently graded. A mesic seed mix will be spread over the site using broadcast seeding methods. Hydromulch will be applied to conserve moisture and prevent erosion.

12.0 NLR SAMPLING LOCATIONS

Several sampling locations are identified as NLR. The soil surface associated with each location was disturbed by slab and structure removal activities, placement of backfill, and regrading. These locations are presented in
Figure 8.

13.0 DQA

The DQOs for this project are described in the BZSAP (DOE 2002a). All DQOs for this project were achieved based on the following:

- Regulatory agency-approved sampling program design (ER Regulatory Contact Record dated May 1, 2003);
- Samples collected in accordance with the BZSAP (DOE 2002a); and
- DQA conducted as documented in the following sections.

13.1 DQA Process

The DQA process ensures that the type, quantity, and quality of environmental data used in decision making are defensible, and is based on the following guidance and requirements:

- EPA QA/G-4, 1994a, Guidance for the Data Quality Objective Process;
- EPA QA/G-9, 1998, Guidance for the Data Quality Assessment Process; Practical Methods for Data Analysis; and
- U.S. Department of Energy (DOE) Order 414.1A, 1999, Quality Assurance.

Verification and validation (V&V) of the data are the primary components of the DQA. The final data are compared with original project DQOs and evaluated with respect to project decisions; uncertainty within the decisions; and quality criteria required for the data, specifically precision, accuracy, representativeness, completeness, comparability, and sensitivity (PARCCS). Validation criteria are consistent with the following RFETS-specific documents and industry guidelines:

- EPA 540/R-94/012, 1994b, USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review;
- EPA 540/R-94/013, 1994c, USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review;
- Kaiser-Hill Company, L.L.C. (K-H) V&V Guidelines:
  - General Guidelines for Data Verification and Validation, DA-GR01-v1, 2002a
  - V&V Guidelines for Isotopic Determinations by Alpha Spectrometry, DA-RC01-v1, 2002b
  - V&V Guidelines for Volatile Organics, DA-SS01-v1, 2002c
  - V&V Guidelines for Semivolatile Organics, DA-SS02-v1, 2002d

- V&V Guidelines for Metals, DA-SS05-v1, 2002e; and.
- Lockheed-Martin, 1997, Evaluation of Radiochemical Data Usability, ES/ER/MS-5.

This report will be submitted to the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) AR for permanent storage 30 days after being provided to the Colorado Department of Public Health and Environment (CDPHE) and U.S. EPA.

13.2 V&V of Results

Verification ensures that data produced and used by the project are documented and traceable in accordance with quality requirements. Validation consists of a technical review of all data that directly support the project decisions so that any limitations of the data relative to project goals are delineated and the associated data are qualified accordingly. The V&V process defines the criteria that constitute data quality, namely PARCCS parameters. Data traceability and archival are also addressed. V&V criteria include the following:

- Chain-of-custody;
- Preservation and hold times;
- Instrument calibrations;
- Preparation blanks;
- Interference check samples (metals);
- Matrix spikes/matrix spike duplicates (MS/MSDs);
- Laboratory control samples (LCSs);
- Field duplicate measurements;
- Chemical yield (radiochemistry);
- Required quantitation limits/minimum detectable activities (sensitivity of chemical and radiochemical measurements, respectively); and
- Sample analysis and preparation methods.

Evaluation of V&V criteria ensures that PARCCS parameters are satisfactory (that is, within tolerances acceptable to the project). Satisfactory V&V of laboratory quality controls are captured through application of validation "flags" or qualifiers to individual records.

Raw hard copy data (for example, individual analytical data packages) are currently filed by report identification (RIN) and maintained by K-H Analytical Services Division

(ASD); older hard copies may reside in the Federal Center in Lakewood, Colorado. Electronic data are stored in the RFETS Soil Water Database (SWD).

The data sets addressed in this report are included on the enclosed compact disc in Microsoft ACCESS 2000 format: (Filename: SW-1_112503.mdb, tables "SWD&LIMS_dqa_real_data_SW-1_112503" and "SWD&LIMS_dqa_qc_data_SW-1_112503").

13.2.1 Accuracy

The following measures of accuracy were evaluated:

- LCS;
- Surrogates;
- Field blanks; and
- Sample MSs.

Results are compared to method requirements and project goals. The results of these comparisons are summarized for RFCA COCs where the result could impact project decisions. Particular attention is paid to those values near ALs when QC results could indicate unacceptable levels of uncertainty for decision-making purposes.

LCS Evaluation

The frequency of LCS measurements, relative to each laboratory batch, is given in Table 7. LCS frequency was adequate based on at least one LCS per batch. The minimum and maximum LCS results are also tabulated, by chemical, for the entire project. Any qualifications of results due to LCS performance exceeding upper or lower tolerance limits are captured in the V&V flags, described in Section 13.2.3.

LCS results that were outside of tolerances were reviewed to determine whether a potential bias might be indicated. LCS recoveries are not indicative of matrix effects since they are not prepared using site samples. LCS results do indicate whether the laboratory may be introducing a bias in the results. Recoveries reported above the upper limit may indicate the actual sample results are less than reported. Since this is environmentally conservative, no further action is needed. The analytes with unacceptable low recoveries were evaluated. If the highest sample result is less than the action limit divided by the lowest LCS recovery for that analyte, no further action is taken because any indicated bias is not great enough to make a falsely low sample result be above the action limit. As a result of these analyses, the LCS recoveries for this project did not impact project decisions based on AL exceedances.

Surrogate Evaluation

Surrogates are added to every sample, and therefore, surrogate recoveries only impact individual samples. Unacceptable surrogate recoveries can indicate potential matrix

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effects. The highest and lowest surrogate recoveries for this project were reviewed and the associated samples results were not near enough to the action limit to indicate project decisions would be impacted.

The frequency of surrogate measurements, relative to each laboratory batch, is given in Table 8. Surrogate frequency was adequate based on at least one set per sample. The minimum and maximum surrogate results are also tabulated, by chemical, for the entire project. Any qualifications of results due to surrogate results are captured in the V&V flags, described in Section 13.2.3.

Field Blank Evaluation

Results of the field blank analyses are given in Table 9. Detectable amounts of contaminants within the blanks, which could indicate possible cross-contamination of samples, are evaluated if the same contaminants are detected in the associated real samples. When the real result is less than 10 times the blank result for laboratory contaminants (5 times the result for non laboratory contaminants), the real result is disqualified. None of the chemicals detected in blanks were detected in real samples where the real sample concentration exceeded ALs, therefore, no significant laboratory blank contamination is indicated.

Table 7
Laboratory Control Sample Evaluation

Test Method	CAS	Analyte	Minimum	Maximum	Unit	Number of Laboratory Samples	Number of Laboratory Batches
SW-846 6010	11-09-7	Uranium, Total	100	106	%REC	6	6
SW-846 6010	7429-90-5	Aluminum	95	106	%REC	6	6
SW-846 6010	7439-89-6	Iron	96	105	%REC	6	6
SW-846 6010	7439-92-1	Lead	95	104	%REC	6	6
SW-846 6010	7439-93-2	Lithium	94	109	%REC	6	6
SW-846 6010	7439-96-5	Manganese	95	106	%REC	6	6
SW-846 6010	7439-97-6	Mercury	90	109	%REC	6	6
SW-846 6010	7439-98-7	Molybdenum	90	102	%REC	6	6
SW-846 6010	7440-02-0	Nickel	93	104	%REC	6	6
SW-846 6010	7440-22-4	Silver	86	100	%REC	6	6
SW-846 6010	7440-24-6	Strontium	97	105	%REC	6	6
SW-846 6010	7440-31-5	Tin	91	101	%REC	6	6
SW-846 6010	7440-36-0	Antimony	92	100	%REC	6	6
SW-846 6010	7440-38-2	Arsenic	94	101	%REC	6	6
SW-846 6010	7440-39-3	Barium	97	105	%REC	6	6
SW-846 6010	7440-41-7	Beryllium	95	108	%REC	6	6
SW-846 6010	7440-43-9	Cadmium	91	103	%REC	6	6
SW-846 6010	7440-47-3	Chromium	96	106	%REC	6	6
SW-846 6010	7440-48-4	Cobalt	93	104	%REC	6	6
SW-846 6010	7440-50-8	Copper	95	101	%REC	6	6
SW-846 6010	7440-62-2	Vanadium	94	106	%REC	6	6
SW-846 6010	7440-66-6	Zinc	91	107	%REC	6	6
SW-846 6010	7782-49-2	Selenium	92	98	%REC	6	6
SW-846 6010/6010B	7439-92-1	Lead	98	98	%REC	1	1
SW-846 6010/6010B	7440-41-7	Beryllium	96	96	%REC	1	1
SW-846 8260	100-41-4	Ethylbenzene	81	106	%REC	5	4
SW-846 8260	100-42-5	Styrene	80	108	%REC	5	4

Test Method	CAS	Analyte	Minimum	Maximum	Unit	Number of Laboratory Samples	Number of Laboratory Batches
SW-846 8260	10061-01-5	cis-1,3-Dichloropropene	86.04	108	%REC	5	4
SW-846 8260	10061-02-6	trans-1,3-Dichloropropene	89	105	%REC	5	4
SW-846 8260	106-46-7	1,4-Dichlorobenzene	87	110	%REC	5	4
SW-846 8260	107-06-2	1,2-Dichloroethane	83.67	104	%REC	5	4
SW-846 8260	108-10-1	4-Methyl-2-pentanone	71.94	114	%REC	5	4
SW-846 8260	108-88-3	Toluene	77	104	%REC	5	4
SW-846 8260	108-90-7	Chlorobenzene	83	104	%REC	5	4
SW-846 8260	120-82-1	1,2,4-Trichlorobenzene	87	111	%REC	5	4
SW-846 8260	124-48-1	Dibromochloromethane	91	101	%REC	5	4
SW-846 8260	127-18-4	Tetrachloroethene	89	108	%REC	5	4
SW-846 8260	1330-20-7	Xylene	80	106	%REC	5	4
SW-846 8260	56-23-5	Carbon Tetrachloride	87.64	112	%REC	5	4
SW-846 8260	67-64-1	Acetone	53.14	188	%REC	5	4
SW-846 8260	67-66-3	Chloroform	86.85	106	%REC	5	4
SW-846 8260	71-43-2	Benzene	79	107	%REC	5	4
SW-846 8260	71-55-6	1,1,1-Trichloroethane	85.14	109	%REC	5	4
SW-846 8260	74-83-9	Bromomethane	84.13	102	%REC	5	4
SW-846 8260	74-87-3	Chloromethane	78	100.2	%REC	5	4
SW-846 8260	75-00-3	Chloroethane	81	106.7	%REC	5	4
SW-846 8260	75-01-4	Vinyl chloride	84	111.7	%REC	5	4
SW-846 8260	75-09-2	Methylene chloride	76	108	%REC	5	4
SW-846 8260	75-15-0	Carbon Disulfide	80.05	119.4	%REC	5	4
SW-846 8260	75-25-2	Bromoform	94	102.6	%REC	5	4
SW-846 8260	75-27-4	Bromodichloromethane	91	103	%REC	5	4
SW-846 8260	75-34-3	1,1-Dichloroethane	83	115	%REC	5	4
SW-846 8260	75-35-4	1,1-Dichloroethene	74	121	%REC	5	4
SW-846 8260	78-87-5	1,2-Dichloropropane	79	104	%REC	5	4
SW-846 8260	78-93-3	2-Butanone	61.25	148	%REC	5	4
SW-846 8260	79-00-5	1,1,2-Trichloroethane	75	106	%REC	5	4

Test Method	CAS	Analyte	Minimum	Maximum	Unit	Number of Laboratory Samples	Number of Laboratory Batches
SW-846 8260	79-01-6	Trichloroethene	88.2	110	%REC	5	4
SW-846 8260	79-34-5	1,1,2,2-Tetrachloroethane	71	109	%REC	5	4
SW-846 8260	87-68-3	Hexachlorobutadiene	86.75	117	%REC	5	4
SW-846 8260	91-20-3	Naphthalene	79	108	%REC	5	4
SW-846 8260	95-50-1	1,2-Dichlorobenzene	85	106	%REC	5	4
SW-846 8270	100-02-7	4-Nitrophenol	67	67	%REC	2	1
SW-846 8270	100-51-6	Benzyl Alcohol	67	67	%REC	2	1
SW-846 8270	105-67-9	2,4-Dimethylphenol	69	69	%REC	2	1
SW-846 8270	106-44-5	4-Methylphenol	68	68	%REC	2	1
SW-846 8270	106-47-8	4-Chloroaniline	20	20	%REC	2	1
SW-846 8270	108-95-2	Phenol	69	69	%REC	2	1
SW-846 8270	111-44-4	bis(2-Chloroethyl)ether	66	66	%REC	2	1
SW-846 8270	117-81-7	bis(2-Ethylhexyl)phthalate	68	68	%REC	2	1
SW-846 8270	117-84-0	Di-n-octylphthalate	62	62	%REC	2	1
SW-846 8270	118-74-1	Hexachlorobenzene	61	61	%REC	2	1
SW-846 8270	120-12-7	Anthracene	64	64	%REC	2	1
SW-846 8270	120-82-1	1,2,4-Trichlorobenzene	66	66	%REC	2	1
SW-846 8270	120-83-2	2,4-Dichlorophenol	68	68	%REC	2	1
SW-846 8270	121-14-2	2,4-Dinitrotoluene	71	71	%REC	2	1
SW-846 8270	129-00-0	Pyrene	60	60	%REC	2	1
SW-846 8270	131-11-3	Dimethylphthalate	64	64	%REC	2	1
SW-846 8270	132-64-9	Dibenzofuran	64	64	%REC	2	1
SW-846 8270	193-39-5	Indeno(1,2,3-cd)pyrene	64	64	%REC	2	1
SW-846 8270	205-99-2	Benzo(b)fluoranthene	62	62	%REC	2	1
SW-846 8270	206-44-0	Fluoranthene	70	70	%REC	2	1
SW-846 8270	207-08-9	Benzo(k)fluoranthene	57	57	%REC	2	1
SW-846 8270	218-01-9	Chrysene	61	61	%REC	2	1
SW-846 8270	39638-32-9	bis(2-Chloroisopropyl)ether	68	68	%REC	2	1
SW-846 8270	50-32-8	Benzo(a)pyrene	62	62	%REC	2	1

Test Method	CAS	Analyte	Minimum	Maximum	Unit	Number of Laboratory Samples	Number of Laboratory Batches
SW-846 8270	51-28-5	2,4-Dinitrophenol	69	69	%REC	2	1
SW-846 8270	53-70-3	Dibenz(a,h)anthracene	64	64	%REC	2	1
SW-846 8270	534-52-1	4,6-Dinitro-2-methylphenol	71	71	%REC	2	1
SW-846 8270	56-55-3	Benzo(a)anthracene	58	58	%REC	2	1
SW-846 8270	606-20-2	2,6-Dinitrotoluene	70	70	%REC	2	1
SW-846 8270	621-64-7	n-Nitrosodipropylamine	69	69	%REC	2	1
SW-846 8270	65-85-0	Benzoic Acid	67	67	%REC	2	1
SW-846 8270	67-72-1	Hexachloroethane	66	66	%REC	2	1
SW-846 8270	77-47-4	Hexachlorocyclopentadiene	73	73	%REC	2	1
SW-846 8270	78-59-1	Isophorone	88	88	%REC	2	1
SW-846 8270	83-32-9	Acenaphthene	64	64	%REC	2	1
SW-846 8270	84-66-2	Diethylphthalate	69	69	%REC	2	1
SW-846 8270	84-74-2	Di-n-butylphthalate	70	70	%REC	2	1
SW-846 8270	85-68-7	Butylbenzylphthalate	68	68	%REC	2	1
SW-846 8270	86-30-6	n-Nitrosodiphenylamine	75	75	%REC	2	1
SW-846 8270	86-73-7	Fluorene	64	64	%REC	2	1
SW-846 8270	87-68-3	Hexachlorobutadiene	63	63	%REC	2	1
SW-846 8270	87-86-5	Pentachlorophenol	63	63	%REC	2	1
SW-846 8270	88-06-2	2,4,6-Trichlorophenol	71	71	%REC	2	1
SW-846 8270	88-74-4	2-Nitroaniline	65	65	%REC	2	1
SW-846 8270	91-20-3	Naphthalene	66	66	%REC	2	1
SW-846 8270	91-57-6	2-Methylnaphthalene	66	66	%REC	2	1
SW-846 8270	91-58-7	2-Chloronaphthalene	65	65	%REC	2	1
SW-846 8270	91-94-1	3,3'-Dichlorobenzidine	39	39	%REC	2	1
SW-846 8270	95-48-7	2-Methylphenol	67	67	%REC	2	1
SW-846 8270	95-57-8	2-Chlorophenol	71	71	%REC	2	1
SW-846 8270	95-95-4	2,4,5-Trichlorophenol	68	68	%REC	2	1
SW-846 8270	98-95-3	Nitrobenzene	69	69	%REC	2	1

Table 8
Surrogate Recovery Summary

VOC Surrogate Recoveries				
Number of Samples	**Analyte**	**Minimum**	**Maximum**	**Unit**
10	1,2-Dichloroethane -d4	90	121.3	%REC
10	Bromofluorobenzene	89	124.2	%REC
10	Toluene - d8	92.45	130.2	%REC
SVOC Surrogate Recoveries				
Number of Samples	**Analyte**	**Minimum**	**Maximum**	**Unit**
2	Terphenyl-d14	44	70	%REC
2	2-Fluorobiphenyl	54	66	%REC
2	o-Fluorophenol	60	72	%REC
2	Nitrobenzene-d5	62	77	%REC

Table 9
Field Blank Summary

Test Method	Analyte	Sample QC Code	Maximum Detected Value	Unit	Lab Results Qualifier Code
GAMMA SPECTROSCOPY	Uranium-235	FB	0.12	pCi/g	-
GAMMA SPECTROSCOPY	Uranium-235	RNS	0.183	pCi/g	-
GAMMA SPECTROSCOPY	Uranium-238	FB	2.45	pCi/g	-
GAMMA SPECTROSCOPY	Uranium-238	RNS	2.83	pCi/g	-
SW-846 6010	Aluminum	RNS	0.048	mg/L	B
SW-846 6010	Iron	RNS	0.032	mg/L	B
SW-846 6010	Manganese	RNS	0.0013	mg/L	B
SW-846 6010	Mercury	RNS	0.000057	mg/L	B
SW-846 6010	Strontium	RNS	0.00092	mg/L	B
SW-846 6010	Barium	RNS	0.0016	mg/L	B
SW-846 6010	Beryllium	RNS	0.0007	mg/L	B
SW-846 6010	Copper	RNS	0.016	mg/L	-
SW-846 6010	Zinc	RNS	0.014	mg/L	B
SW-846 8260	Toluene	FB	0.28	ug/L	JB
SW-846 8260	Toluene	RNS	3.1	ug/L	JB
SW-846 8260	Toluene	TB	3.4	ug/L	JB
SW-846 8260	Acetone	RNS	14	ug/L	JB
SW-846 8260	Acetone	TB	13	ug/L	JB
SW-846 8260	Methylene chloride	FB	0.34	ug/L	JB
SW-846 8260	Methylene chloride	RNS	0.44	ug/L	JB
SW-846 8260	Methylene chloride	TB	0.45	ug/L	JB
SW-846 8260	Naphthalene	FB	1.2	ug/L	J
SW-846 8260	Naphthalene	RNS	0.86	ug/L	J

Field blanks (Trip [TB], Rinse [RNS], Field [FB]) results greater than detection limits (not *U* qualified)

Sample MS Evaluation

The frequency of MS measurements, relative to each laboratory batch, was adequate based on at least one MS per batch. The minimum and maximum of MS results are summarized by chemical, for the entire project, in Table 10. Any qualifications of results due to MS results exceeding upper or lower tolerance limits are captured in the V&V flags, described in Section 13.2.3.

Organic analytes with unacceptable low recoveries resulted in a review of the LCS recoveries. According to the EPA data validation guidelines, if organic matrix spike recoveries are low, then the LCS recovery is to be checked and, if acceptable, no action is to be taken. For this project, these checks indicate no decisions were impacted for organic analytes. For inorganics, the associated sample results were divided by the lowest percent recovery for each analyte. If the resulting number is less than the action limit, decisions were not impacted, so no action was taken. For this project, all results were acceptable, however, aluminum, cadmium, chromium, copper, iron, lead, manganese, molbdenum, nickel, and silver had 0% recovery as a low. With exception to lead, the action levels for these analytes were at least an order of magnitude higher than

the highest sample result, so no decisions were impacted. Although lead was slightly elevated above the ecological receptor AL in several samples, the highest result was an order of magnitude less than the WRW AL, therefore accelerated action decisions were not impacted.

Table 10
Sample Matrix Spike Evaluation

Test Method	CAS	Analyte	Minimum	Maximum	Unit	Number of Laboratory Samples	Number of Laboratory Batches
SW-846 6010	11-09-7	Uranium, Total	84	384	%REC	8	8
SW-846 6010	7429-90-5	Aluminum	0	2640	%REC	8	8
SW-846 6010	7439-89-6	Iron	0	11900	%REC	8	8
SW-846 6010	7439-92-1	Lead	0	12000	%REC	8	8
SW-846 6010	7439-93-2	Lithium	93	112	%REC	8	8
SW-846 6010	7439-96-5	Manganese	0	154	%REC	8	8
SW-846 6010	7439-97-6	Mercury	92	217	%REC	7	7
SW-846 6010	7439-98-7	Molybdenum	0	103	%REC	8	8
SW-846 6010	7440-02-0	Nickel	0	105	%REC	8	8
SW-846 6010	7440-22-4	Silver	0	301	%REC	8	8
SW-846 6010	7440-24-6	Strontium	88	105	%REC	8	8
SW-846 6010	7440-31-5	Tin	86	180	%REC	8	8
SW-846 6010	7440-36-0	Antimony	27	101	%REC	8	8
SW-846 6010	7440-38-2	Arsenic	82	105	%REC	8	8
SW-846 6010	7440-39-3	Barium	78	164	%REC	8	8
SW-846 6010	7440-41-7	Beryllium	80	113	%REC	8	8
SW-846 6010	7440-43-9	Cadmium	0	104	%REC	8	8
SW-846 6010	7440-47-3	Chromium	0	107	%REC	8	8
SW-846 6010	7440-48-4	Cobalt	13	105	%REC	8	8
SW-846 6010	7440-50-8	Copper	0	173	%REC	8	8
SW-846 6010	7440-62-2	Vanadium	73	107	%REC	8	8
SW-846 6010	7440-66-6	Zinc	0	104	%REC	8	8
SW-846 6010	7782-49-2	Selenium	82	101	%REC	8	8
SW-846 6010/6010B	7439-92-1	Lead	90	101	%REC	2	2
SW-846 6010/6010B	7440-41-7	Beryllium	89	100	%REC	2	2
SW-846 8260	100-41-4	Ethylbenzene	100	145.3	%REC	2	2
SW-846 8260	100-42-5	Styrene	52.76	97	%REC	2	2
SW-846 8260	10061-01-5	cis-1,3-Dichloropropene	74.35	101	%REC	2	2
SW-846 8260	10061-02-6	trans-1,3-Dichloropropene	53.32	94	%REC	2	2
SW-846 8260	106-46-7	1,4-Dichlorobenzene	34.76	108	%REC	2	2
SW-846 8260	107-06-2	1,2-Dichloroethane	82.6	99	%REC	2	2
SW-846 8260	108-10-1	4-Methyl-2-pentanone	86	95.29	%REC	2	2
SW-846 8260	108-88-3	Toluene	72.84	92	%REC	2	2
SW-846 8260	108-90-7	Chlorobenzene	81.47	101	%REC	2	2
SW-846 8260	120-82-1	1,2,4-Trichlorobenzene	17.72	105	%REC	2	2
SW-846 8260	124-48-1	Dibromochloromethane	85.21	92	%REC	2	2
SW-846 8260	127-18-4	Tetrachloroethene	87.88	96	%REC	2	2
SW-846 8260	1330-20-7	Xylene	101	131.2	%REC	2	2

Test Method	CAS	Analyte	Minimum	Maximum	Unit	Number of Laboratory Samples	Number of Laboratory Batches
SW-846 8260	56-23-5	Carbon Tetrachloride	97.12	106	%REC	2	2
SW-846 8260	67-64-1	Acetone	90	184.4	%REC	2	2
SW-846 8260	67-66-3	Chloroform	90.27	97	%REC	2	2
SW-846 8260	71-43-2	Benzene	71.49	96	%REC	2	2
SW-846 8260	71-55-6	1,1,1-Trichloroethane	102.5	105	%REC	2	2
SW-846 8260	74-83-9	Bromomethane	94.32	113	%REC	2	2
SW-846 8260	74-87-3	Chloromethane	106	113.3	%REC	2	2
SW-846 8260	75-00-3	Chloroethane	103.5	118	%REC	2	2
SW-846 8260	75-01-4	Vinyl chloride	87.83	107	%REC	2	2
SW-846 8260	75-09-2	Methylene chloride	83.96	99	%REC	2	2
SW-846 8260	75-15-0	Carbon Disulfide	59.52	100	%REC	2	2
SW-846 8260	75-25-2	Bromoform	91	126.5	%REC	2	2
SW-846 8260	75-27-4	Bromodichloromethane	100	107.5	%REC	2	2
SW-846 8260	75-34-3	1,1-Dichloroethane	95.31	96	%REC	2	2
SW-846 8260	75-35-4	1,1-Dichloroethene	83.34	114	%REC	2	2
SW-846 8260	78-87-5	1,2-Dichloropropane	101	122.8	%REC	2	2
SW-846 8260	78-93-3	2-Butanone	81	118.4	%REC	2	2
SW-846 8260	79-00-5	1,1,2-Trichloroethane	93	106.5	%REC	2	2
SW-846 8260	79-01-6	Trichloroethene	87.23	103	%REC	2	2
SW-846 8260	79-34-5	1,1,2,2-Tetrachloroethane	109	170.5	%REC	2	2
SW-846 8260	87-68-3	Hexachlorobutadiene	95.38	107	%REC	2	2
SW-846 8260	91-20-3	Naphthalene	10.34	100	%REC	2	2
SW-846 8260	95-50-1	1,2-Dichlorobenzene	42.07	106	%REC	2	2
SW-846 8270	100-02-7	4-Nitrophenol	54	54	%REC	1	1
SW-846 8270	100-51-6	Benzyl Alcohol	57	57	%REC	1	1
SW-846 8270	105-67-9	2,4-Dimethylphenol	57	57	%REC	1	1
SW-846 8270	106-44-5	4-Methylphenol	59	59	%REC	1	1
SW-846 8270	106-47-8	4-Chloroaniline	45	45	%REC	1	1
SW-846 8270	108-95-2	Phenol	58	58	%REC	1	1
SW-846 8270	111-44-4	bis(2-Chloroethyl)ether	57	57	%REC	1	1
SW-846 8270	117-81-7	bis(2-Ethylhexyl)phthalate	56	56	%REC	1	1
SW-846 8270	117-84-0	Di-n-octylphthalate	52	52	%REC	1	1
SW-846 8270	118-74-1	Hexachlorobenzene	52	52	%REC	1	1
SW-846 8270	120-12-7	Anthracene	55	55	%REC	1	1
SW-846 8270	120-82-1	1,2,4-Trichlorobenzene	55	55	%REC	1	1
SW-846 8270	120-83-2	2,4-Dichlorophenol	57	57	%REC	1	1
SW-846 8270	121-14-2	2,4-Dinitrotoluene	61	61	%REC	1	1
SW-846 8270	129-00-0	Pyrene	51	51	%REC	1	1
SW-846 8270	131-11-3	Dimethylphthalate	54	54	%REC	1	1
SW-846 8270	132-64-9	Dibenzofuran	55	55	%REC	1	1
SW-846 8270	193-39-5	Indeno(1,2,3-cd)pyrene	53	53	%REC	1	1
SW-846 8270	205-99-2	Benzo(b)fluoranthene	49	49	%REC	1	1
SW-846 8270	206-44-0	Fluoranthene	61	61	%REC	1	1
SW-846 8270	207-08-9	Benzo(k)fluoranthene	49	49	%REC	1	1
SW-846 8270	218-01-9	Chrysene	51	51	%REC	1	1

Test Method	CAS	Analyte	Minimum	Maximum	Unit	Number of Laboratory Samples	Number of Laboratory Batches
SW-846 8270	39638-32-9	bis(2-Chloroisopropyl)ether	57	57	%REC	1	1
SW-846 8270	50-32-8	Benzo(a)pyrene	52	52	%REC	1	1
SW-846 8270	51-28-5	2,4-Dinitrophenol	57	57	%REC	1	1
SW-846 8270	53-70-3	Dibenz(a,h)anthracene	53	53	%REC	1	1
SW-846 8270	534-52-1	4,6-Dinitro-2-methylphenol	58	58	%REC	1	1
SW-846 8270	56-55-3	Benzo(a)anthracene	50	50	%REC	1	1
SW-846 8270	606-20-2	2,6-Dinitrotoluene	60	60	%REC	1	1
SW-846 8270	621-64-7	n-Nitrosodipropylamine	58	58	%REC	1	1
SW-846 8270	65-85-0	Benzoic Acid	49	49	%REC	1	1
SW-846 8270	67-72-1	Hexachloroethane	56	56	%REC	1	1
SW-846 8270	77-47-4	Hexachlorocyclopentadiene	59	59	%REC	1	1
SW-846 8270	78-59-1	Isophorone	74	74	%REC	1	1
SW-846 8270	83-32-9	Acenaphthene	56	56	%REC	1	1
SW-846 8270	84-66-2	Diethylphthalate	60	60	%REC	1	1
SW-846 8270	84-74-2	Di-n-butylphthalate	60	60	%REC	1	1
SW-846 8270	85-68-7	Butylbenzylphthalate	56	56	%REC	1	1
SW-846 8270	86-30-6	n-Nitrosodiphenylamine	63	63	%REC	1	1
SW-846 8270	86-73-7	Fluorene	56	56	%REC	1	1
SW-846 8270	87-68-3	Hexachlorobutadiene	53	53	%REC	1	1
SW-846 8270	87-86-5	Pentachlorophenol	49	49	%REC	1	1
SW-846 8270	88-06-2	2,4,6-Trichlorophenol	60	60	%REC	1	1
SW-846 8270	88-74-4	2-Nitroaniline	56	56	%REC	1	1
SW-846 8270	91-20-3	Naphthalene	55	55	%REC	1	1
SW-846 8270	91-57-6	2-Methylnaphthalene	55	55	%REC	1	1
SW-846 8270	91-58-7	2-Chloronaphthalene	56	56	%REC	1	1
SW-846 8270	91-94-1	3,3'-Dichlorobenzidine	40	40	%REC	1	1
SW-846 8270	95-48-7	2-Methylphenol	60	60	%REC	1	1
SW-846 8270	95-57-8	2-Chlorophenol	60	60	%REC	1	1
SW-846 8270	95-95-4	2,4,5-Trichlorophenol	59	59	%REC	1	1
SW-846 8270	98-95-3	Nitrobenzene	58	58	%REC	1	1

13.1.2 Precision

MSD Evaluation

Laboratory precision is measured through the use of MSDs. Adequate frequency of MSD measurements is indicated by at least one MSD in each laboratory batch. Table 11 indicates that MSD frequencies were adequate. Ideally, repeatability of MS recoveries should have a relative percent difference (RPD) of 35 percent or less.

The analytes with the highest RPDs exceeding 35 percent were reviewed by comparing the highest sample result to the action limit. If the highest samples were sufficiently below the action limit, no further action is needed. For this project, the reviews indicated decisions were not impacted.

Table 11
Sample Matrix Spike Duplicate Evaluation

Analyte	Number of Sample Pairs	Number of Laboratory Batches	Max of RPD
1,1,1-Trichloroethane	2	2	6.82
1,1,2,2-Tetrachloroethane	2	2	15.14
1,1,2-Trichloroethane	2	2	11.78
1,1-Dichloroethane	2	2	7.74
1,1-Dichloroethene	2	2	7.27
1,2,4-Trichlorobenzene	2	2	12.47
1,2,4-Trichlorobenzene	1	1	1.83
1,2-Dichlorobenzene	2	2	14.15
1,2-Dichloroethane	2	2	6.98
1,2-Dichloropropane	2	2	15.06
1,4-Dichlorobenzene	2	2	11.95
2,4,5-Trichlorophenol	1	1	3.45
2,4,6-Trichlorophenol	1	1	3.39
2,4-Dichlorophenol	1	1	0.00
2,4-Dimethylphenol	1	1	0.00
2,4-Dinitrophenol	1	1	3.45
2,4-Dinitrotoluene	1	1	0.00
2,6-Dinitrotoluene	1	1	3.39
2-Butanone	2	2	4.38
2-Chloronaphthalene	1	1	3.64
2-Chlorophenol	1	1	0.00
2-Methylnaphthalene	1	1	0.00
2-Methylphenol	1	1	5.13
2-Nitroaniline	1	1	0.00
3,3'-Dichlorobenzidine	1	1	4.88
4,6-Dinitro-2-methylphenol	1	1	3.39
4-Chloroaniline	1	1	6.45
4-Methyl-2-pentanone	2	2	2.21
4-Methylphenol	1	1	1.68
4-Nitrophenol	1	1	1.83
Acenaphthene	1	1	5.50
Acetone	2	2	26.42
Aluminum	6	6	111.28
Anthracene	1	1	0.00
Antimony	8	8	15.09
Arsenic	8	8	5.35
Barium	8	8	112.38
Benzene	2	2	6.10
Benzo(a)anthracene	1	1	1.98
Benzo(a)pyrene	1	1	0.00
Benzo(b)fluoranthene	1	1	0.00
Benzo(k)fluoranthene	1	1	2.02
Benzoic Acid	1	1	15.09

Analyte	Number of Sample Pairs	Number of Laboratory Batches	Max of RPD
Benzyl Alcohol	1	1	0.00
Beryllium	8	8	27.96
Beryllium	2	2	2.27
bis(2-Chloroethyl)ether	1	1	5.41
bis(2-Chloroisopropyl)ether	1	1	0.00
bis(2-Ethylhexyl)phthalate	1	1	1.77
Bromodichloromethane	2	2	15.54
Bromoform	2	2	13.41
Bromomethane	2	2	12.18
Butylbenzylphthalate	1	1	1.77
Cadmium	6	6	32.37
Carbon Disulfide	2	2	3.92
Carbon Tetrachloride	2	2	7.51
Chlorobenzene	2	2	12.38
Chloroethane	2	2	11.99
Chloroform	2	2	9.02
Chloromethane	2	2	8.08
Chromium	6	6	149.74
Chrysene	1	1	1.94
cis-1,3-Dichloropropene	2	2	13.82
Cobalt	8	8	122.39
Copper	6	6	178.86
Dibenz(a,h)anthracene	1	1	1.90
Dibenzofuran	1	1	3.70
Dibromochloromethane	2	2	13.53
Diethylphthalate	1	1	3.39
Dimethylphthalate	1	1	1.87
Di-n-butylphthalate	1	1	3.39
Di-n-octylphthalate	1	1	1.90
Ethylbenzene	2	2	16.30
Fluoranthene	1	1	1.65
Fluorene	1	1	3.64
Hexachlorobenzene	1	1	1.94
Hexachlorobutadiene	2	2	21.81
Hexachlorobutadiene	1	1	1.90
Hexachlorocyclopentadiene	1	1	7.02
Hexachloroethane	1	1	1.80
Indeno(1,2,3-cd)pyrene	1	1	1.90
Iron	4	4	175.00
Isophorone	1	1	0.00
Lead	6	6	97.77
Lead	2	2	3.39
Lithium	8	8	20.09

Analyte	Number of Sample Pairs	Number of Laboratory Batches	Max of RPD
Manganese	6	6	48.94
Mercury	7	7	12.15
Methylene chloride	2	2	10.07
Molybdenum	7	7	7.14
Naphthalene	2	2	2.65
Naphthalene	1	1	0.00
Nickel	6	6	12.35
Nitrobenzene	1	1	0.00
n-Nitrosodiphenylamine	1	1	1.60
n-Nitrosodipropylamine	1	1	0.00
Pentachlorophenol	1	1	0.00
Phenol	1	1	0.00
Pyrene	1	1	0.00
Selenium	8	8	7.06
Silver	7	7	26.32
Strontium	8	8	23.01
Styrene	2	2	9.74
Tetrachloroethene	2	2	13.00
Tin	8	8	73.76
Toluene	2	2	12.76
trans-1,3-Dichloropropene	2	2	12.66
Trichloroethene	2	2	11.21
Uranium, Total	8	8	22.22
Vanadium	8	8	30.93
Vinyl chloride	2	2	7.05
Xylene	2	2	14.47
Zinc	5	5	18.60

Field Duplicate Evaluation

Field duplicate results reflect sampling precision, or overall repeatability of the sampling process. The frequency of field duplicate collection should exceed 1 field duplicate per 20 real samples, or 5 percent. Table 12 indicates that sampling frequencies were adequate.

Table 12
Field Duplicate Sample Frequency

Test Method	Sample Code	Number of Samples	% Duplicate Samples
ALPHA SPEC	REAL	4	
GAMMA SPECTROSCOPY	REAL	34	8.82%
GAMMA SPECTROSCOPY	DUP	3	
SW-846 6010	REAL	12	
SW-846 6010/6010B	REAL	12	8.33%
SW-846 6010/6010B	DUP	1	

Test Method	Sample Code	Number of Samples	% Duplicate Samples
SW-846 6200	REAL	3	33.33%
SW-846 6200	DUP	1	
SW-846 8260	REAL	11	18.18%
SW-846 8260	DUP	2	
SW-846 8270	REAL	3	33.33%
SW-846 8270	DUP	1	

Precision of field duplicate samples is represented by the RPD values, which are given in Table 13. The majority of the RPD values were less than 10 percent. Lead and beryllium RPDs were 68 percent and 58 percent, respectively.

The RPDs indicate how much variation exists in the field duplicate analyses. The EPA data validation guidelines state that "there are no required review criteria for field duplicate analyses comparability". For the DQA, the highest Max RPDs were reviewed. The highest sample amount for those analytes were corrected for the associated RPD and the resulting number was compared to the action limit. For this project, none of the corrected numbers were greater than the action limit, so project decisions were not impacted.

Table 13
RPD Evaluation

Analyte	Max of RPD %
4-Methyl-2-pentanone	4
Toluene	7
Chlorobenzene	7
Phenol	0
bis(2-Chloroethyl)ether	0
bis(2-Ethylhexyl)phthalate	0
Di-n-octylphthalate	0
Hexachlorobenzene	0
Anthracene	3
1,2,4-Trichlorobenzene	7
2,4-Dichlorophenol	0
bis(2-Chloroisopropyl)ether	0
Benzo(a)pyrene	0
2,4-Dinitrophenol	3
4,6-Dinitro-2-methylphenol	3
Dibenz(a,h)anthracene	0
Copper	5
Zinc	3
Methylene chloride	7
Carbon Disulfide	7
Bromoform	7
Bromodichloromethane	7
Hexachlorocyclopentadiene	0

Analyte	Max of RPD %
Isophorone	0
2,4-Dinitrotoluene	0
Dibromochloromethane	7
Dimethylphthalate	0
Dibenzofuran	0
Indeno(1,2,3-cd)pyrene	0
Benzo(k)fluoranthene	0
2,6-Dinitrotoluene	0
n-Nitrosodipropylamine	0
Benzoic Acid	3
Chloroform	7
Hexachloroethane	0
Benzene	7
4-Nitrophenol	3
Styrene	7
Benzyl Alcohol	0
cis-1,3-Dichloropropene	7
2,4-Dimethylphenol	0
4-Methylphenol	0
4-Chloroaniline	0
Trichloroethene	7
Acenaphthene	3
Diethylphthalate	0
Di-n-butylphthalate	0
Butylbenzylphthalate	0
n-Nitrosodiphenylamine	0
Fluorene	0
Hexachlorobutadiene	0
Pentachlorophenol	3
2,4,6-Trichlorophenol	0
2-Nitroaniline	3
Naphthalene	7
2-Methylnaphthalene	0
2-Chloronaphthalene	0
2-Methylphenol	0
2-Chlorophenol	0
2,4,5-Trichlorophenol	0
Nitrobenzene	0
Iron	0
Lead	68
Strontium	0
Barium	5
Beryllium	58

13.2.3 Completeness

Based on original project DQOs, a minimum of 25 percent of ER Program analytical results must be formally verified and validated. Of that percentage, no more than 10 percent of the results may be rejected, which ensures that analytical laboratory practices are consistent with quality requirements. Table 14 shows the number and percentage of validated records (codes without "1"), verified records (codes with "1"), and rejected records for each analyte group. The percentage of rejected records was acceptable. Because the frequency of validation for the ER Program is adequate, the results are considered adequate for use in project decisions.

13.2.4 Sensitivity

Reporting limits, in units of micrograms per kilogram (ug/kg) for organics, mg/kg for metals, and picocuries per gram (pCi/g) for radionuclides, were compared with the RFCA WRW and ecological receptor ALs. Adequate sensitivities of analytical methods were attained for all COCs that affect project decisions. "Adequate" sensitivity is defined as a reporting limit less than an analyte's associated AL, typically less than one-half the AL.

Table 14
Validation and Verification Summary

Validation Code	Number Records	Radionuclides	Metals	VOCs	SVOCs
No V&V	87	87	0	0	0
1	9	9	0	0	0
J	42	0	41	1	0
J1	5	0	5	0	0
V	887	113	257	364	153
V1	27	9	18	0	0
JB	12	0	0	12	0
UJ	39	0	17	19	3
Total	1108	218	338	396	156
Validated	980	113	315	396	156
% Validated	88.45%	51.83%	93.20%	100.00%	100.00%
Verified Only	41	18	23	0	0
% Verified Only	3.70%	8.26%	6.80%	0.00%	0.00%

Key:
Validated J, V, JB,UJ
Verified 1, J1, V1

13.3 Summary of Data Quality

The RFETS validation goal of 25% was met for this project and none of the QC exceedances were large enough to cause rejection of any sample results. The individual exceedances were reviewed to determine whether they impacted project decisions. The

V&V information supplied in this report may change. If additional V&V information is received, IHSS Group SW-1 records will be updated in SWD. Any data qualified as a result of additional data will be assessed as part of the CRA process.

Overall, all of the PARCCS parameters were evaluated for this IHSS Group. Although there were individual exceedances of QC limits, the overall data quality indicate the project decisions were correct. Also, the impacts of the individual exceedances were found to have no impact on final project decisions.

14.0 CONCLUSION

Results of the accelerated action justify NFAA for IHSS Group SW-1. Justification is based on the following:

- No accelerated action required by surface soil data;
- No accelerated action required by the SSRS;
- No accelerated action required by the stewardship evaluation; and
- No accelerated action required by ALARA considerations (that is, no elevated concentrations of radionuclides).

15.0 AR DOCUMENTS

AR documents, in addition to those listed in the ER RSOP Notification, are as follows:

CDPHE and EPA, 2002, Approval of NFA Designation for IHSSs and PACs, February 14.

DOE, 2002, Buffer Zone Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2003, RFCA Standard Operating Protocol for Recycling Concrete, Rocky Flats Environmental Technology Site, Golden, Colorado.

DOE, 2003, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation Modification 1, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

16.0 REFERENCES

CDPHE and EPA, 2002, Approval of NFA Designation for IHSSs and PACs, February 14.

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Golden, Colorado, June.

DOE, 1999, Order 414.1A, Quality Assurance.

DOE, 2000, Rocky Flats Cleanup Agreement (RFCA), Attachment 5, March.

DOE, 2001, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002a, Buffer Zone Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2003a, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003b, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation Modification 1, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003c, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil RemediationNotification #03-09, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2003d, RFCA Standard Operating Protocol for Recycling Concrete, Rocky Flats Environmental Technology Site, Golden, Colorado.

DOE, 2003e, Rocky Flats Environmental Technology Site Quarterly Environmental Monitoring Report, October–December 2002, Golden, Colorado.

DOE, CDPHE and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachment, U.S. Department of Energy, Colorado Department of Public Health and Environment, and U.S. Environmental Protection Agency, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

EPA, 1994a, Guidance for the Data Quality Objective Process, QA/G-4.

EPA, 1994b, USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, 540/R-94/012.

EPA, 1994c, USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, 540/R-94/013.

EPA, 1998, Guidance for the Data Quality Assessment Process; Practical Methods for Data Analysis, QA/G-9.

EPA, 2003a, No Further Accelerated Action (NFAA) Justification for Ash Pits, and Trenches T-3, T-4 and T-7 Approval Letter, June 12.

EPA, 2003b, ER RSOP Notification #03-09 Approval Letter, September 4.

K-H, 2002a, General Guidelines for Data Verification and Validation, DA-GR01-v1, December.

K-H, 2002b, V&V Guidelines for Isotopic Determinations by Alpha Spectrometry, DARC01-v1, February.

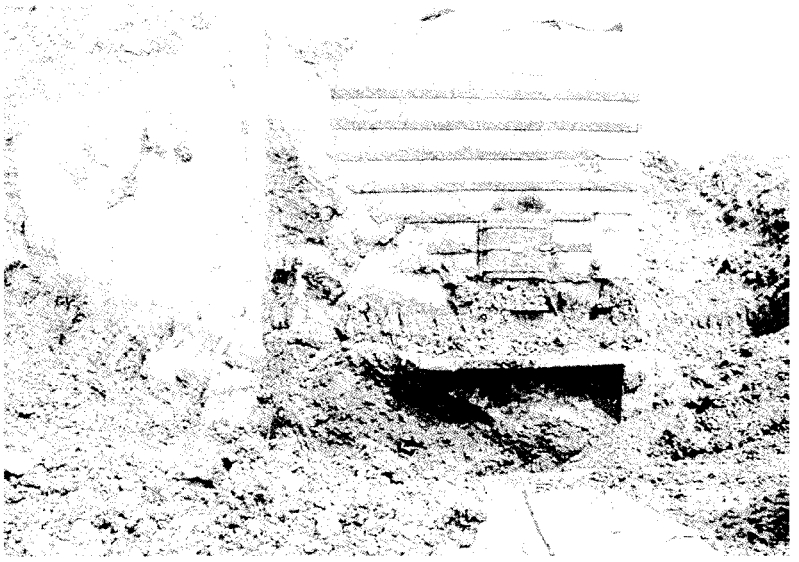
K-H, 2002c, V&V Guidelines for Volatile Organics, DA-SS01-v1, December.

K-H, 2002d, V&V Guidelines for Semivolatile Organics, DA-SS02-v1, December.

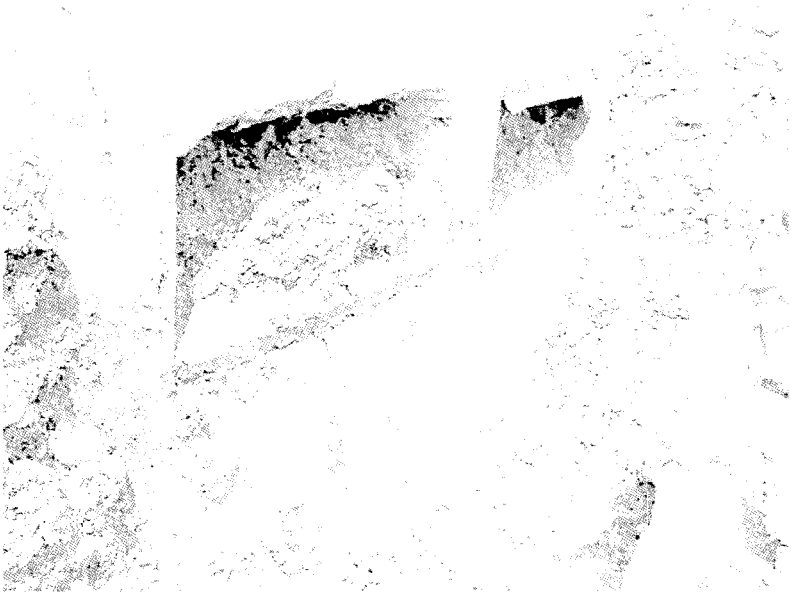
K-H, 2002e, V&V Guidelines for Metals, DA-SS05-v1, December.

Lockheed-Martin, 1997, Evaluation of Radiochemical Data Usability, ES/ER/MS-5.

Appendix A
Project Photographs



Incinerator view towards the east.

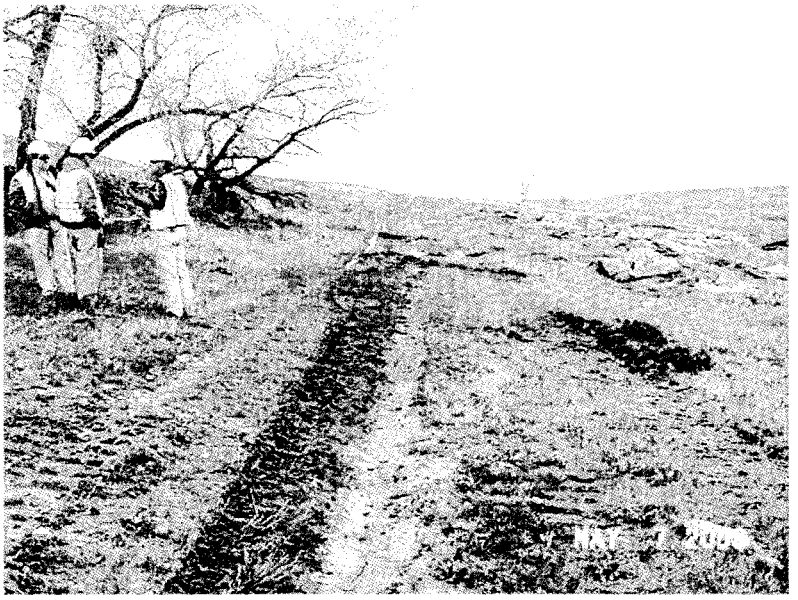


Incinerator chutes.

Incinerator chutes view looking towards the north.

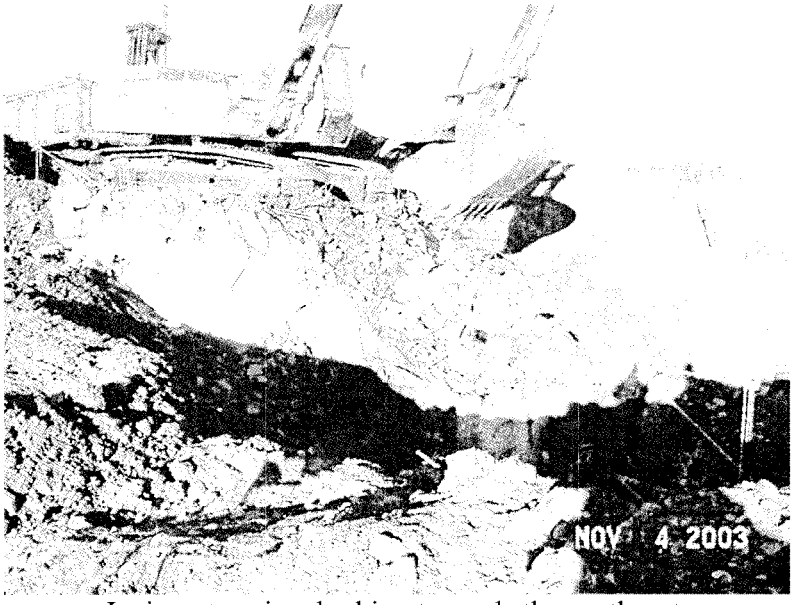
Incinerator view looking towards the south.

Excavation activities at the Incinerator.



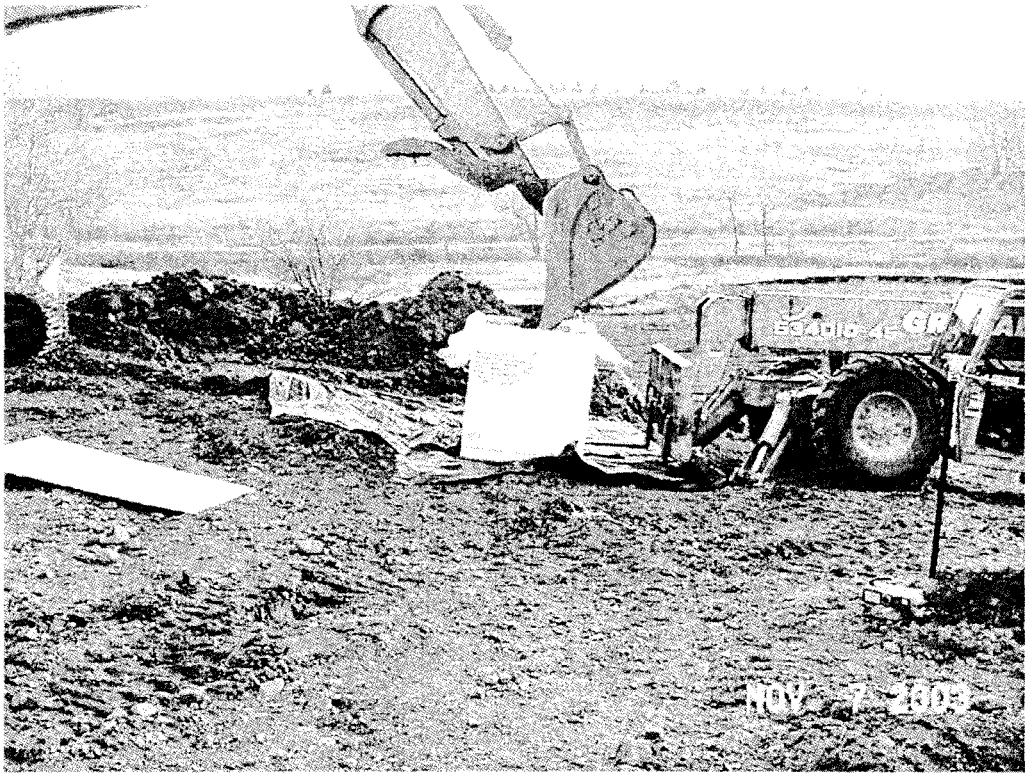
Concrete debris view looking towards the east.

Lower slab debris.



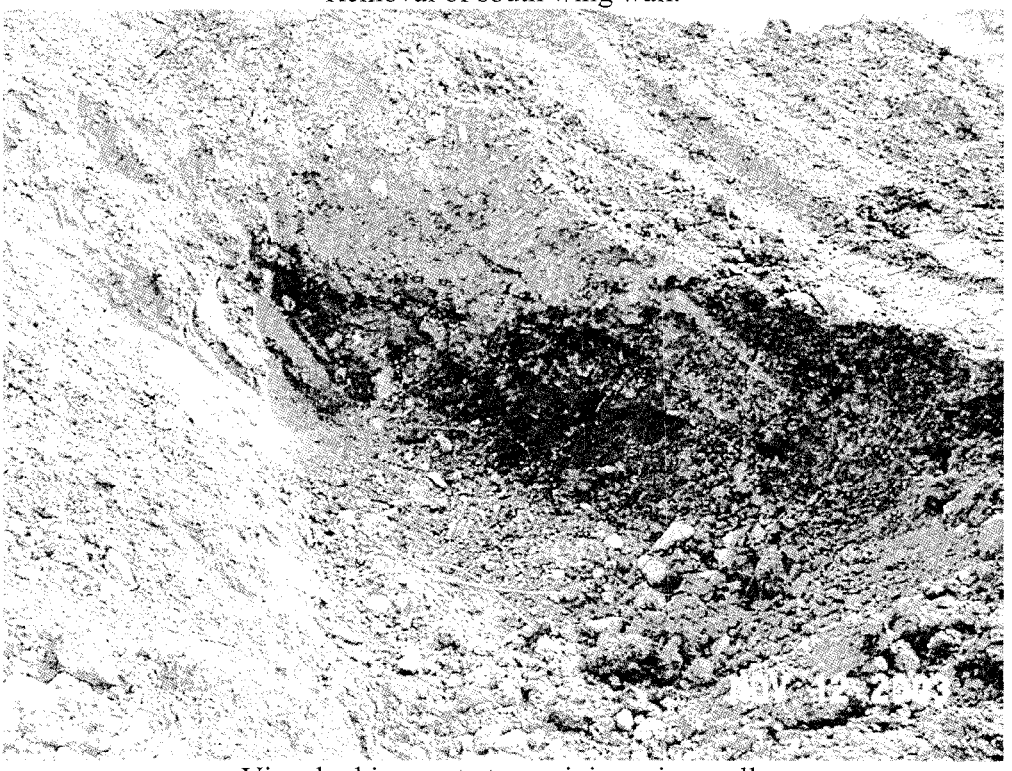
Incinerator view looking towards the northeast.

Incinerator slab.



Loading ash material into waste crate.

Removal of south wing wall.

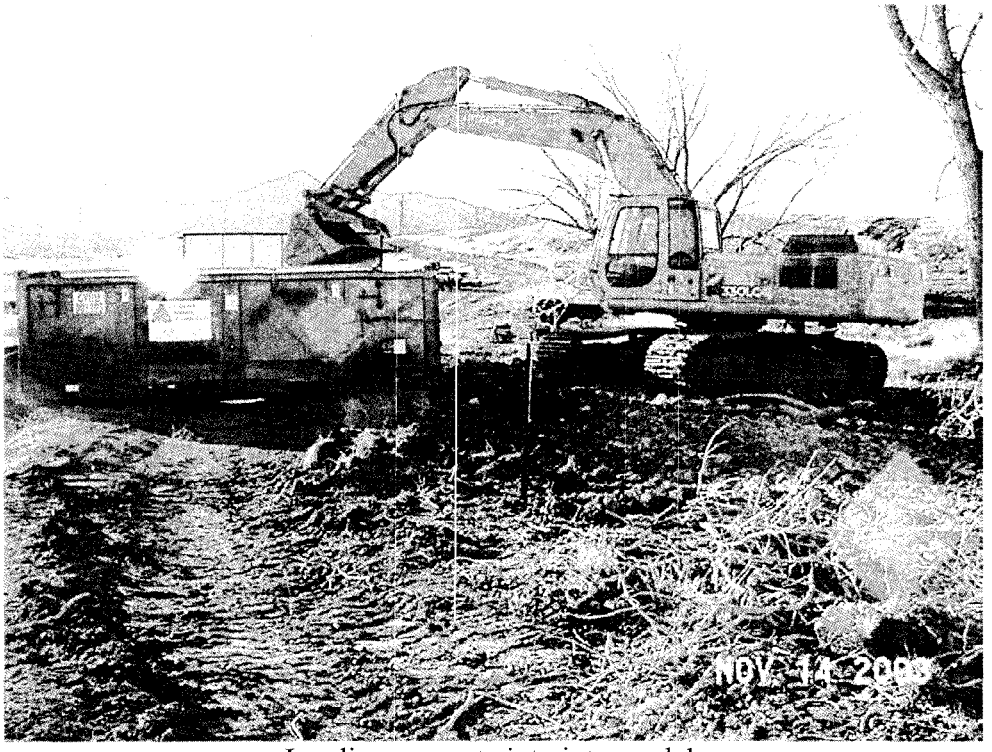


View looking east at remaining wing wall.

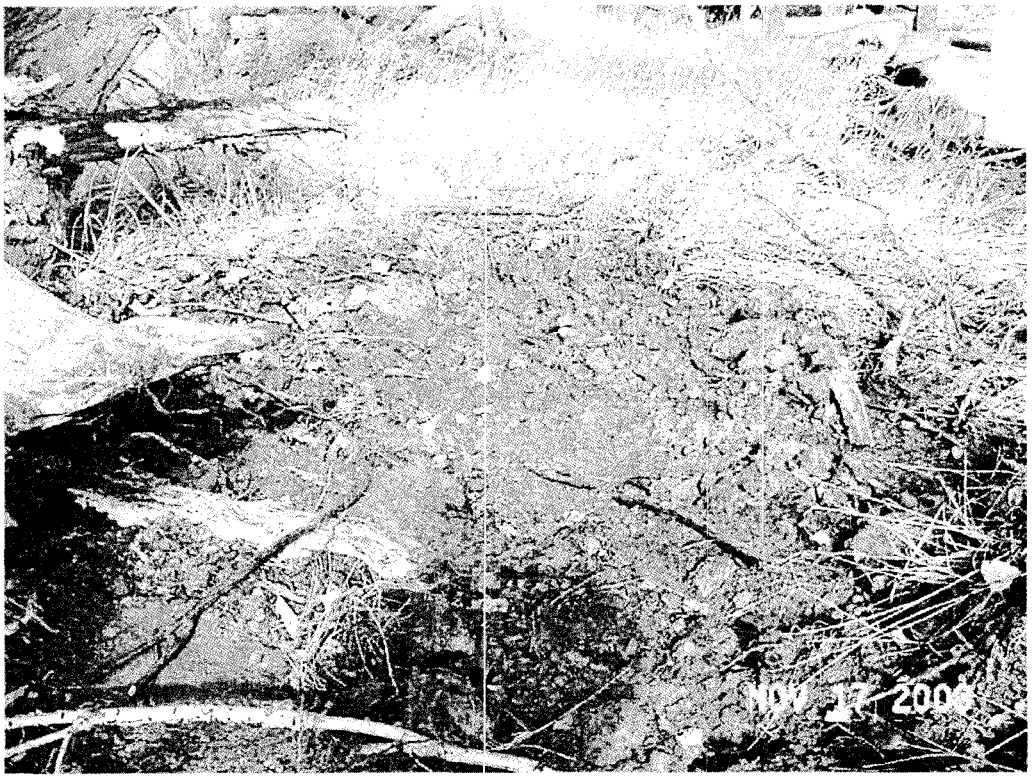
North wall prior to removal.

Regrading slope.

Trash debris.



Loading concrete into intermodal.



Soil removal from bank.

Bottles and trash debris.

Appendix B
Correspondence

NFAA A84 Pt 3 c-c

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8
999 18TH STREET - SUITE 300
DENVER, CO 80202-2466
Phone 800-227-8917
http://www.epa.gov/region08

Fax to
Rick DiSalvo
303 966 6054
from
Tim Rehder

Ref:8EPR-F

June 12, 2003

Richard J. DiSalvo
Acting Assistant Manager for Environmental Stewardship
U.S. Department of Energy
Rocky Flats Field Office
10808 Highway 93, Unit A
Golden, Colorado 80403-8200

Subject: No Further Accelerated Action (NFAA) Justification for Ash Pits PAC Reference Number(s) SW-133.1, SW-133.2, SW-133.4 and 1702 (dated June 11, 2003), NFAA Justification for Trench T-7 PAC Reference Number: NE 111.4 (dated May 21, 2003, NFAA Justification Trenches T-3 and T-4 PAC Reference Number: 111.1 (dated May 21, 2003)

Dear Mr. DiSalvo:

The Environmental Protection Agency has reviewed the documents referenced above and agree that the residual contamination at the Ash Pits, and Trenches T-3, T-4 and T-7 does not pose a significant threat to human health given that Rocky Flats will become a wildlife refuge at the completion of the cleanup, and that a wildlife refuge worker would be the individual with the highest potential for exposure to contaminants. EPA therefore agrees that no further accelerated action is necessary at the Ash Pits, and Trenches T-3, T-4 and T-7 to protect human health.

However, considerable work still needs to be conducted to determine whether residual contamination at Rocky Flats poses a significant ecological risk. Until that work is complete, EPA cannot assert that NFAA determinations for the Ash Pits, and Trenches T-3, T-4 and T-7 are protective of both human health and the environment. EPA looks forward to working with DOE and its contractor on the ecological portion of the Comprehensive Risk Assessment that is currently underway.

Furthermore, since the Ashpits, and Trenches T-3, T-4 and T-7 contain contamination at levels that would not allow for unrestricted use, a comprehensive, enforceable plan for long-term stewardship of these areas is critical to assure that the remedy for Rocky Flats continues to be protective. EPA, again, looks forward to working with the DOE and the State of Colorado in developing such a plan and putting the necessary agreements into place.

Revised 01/02

CORRES. CONTROL
INCOMING LTR NO.

00120RFC2

DUE DATE
ACTION

DIST.	LTR	ENC
BOGENBERGER, V.		
BOGNAR, E.	X	X
BRAILSFORD, M.D.		
BURNS, T. F.		
DECK, C. A.	X	X
DEGENHART, K.		
DIETERLE, S. E.		
FERRERA, D.W.		
FERRI, M.S.		
GERMAIN, A. L.		
GIACOMINI, J.		
HALL, I.		
ISOM, J. H.		
MARTINEZ, L.A.	X	X
NORTH, K.	X	X
PARKER, A.M.		
POWERS, K.		
RAAZ, R. D.		
RODGERS, A. D.		
SCOTT, G.K.		
SHELTON, D.C.	X	X
SPEARS, M.S.		
RICE, K.D.		
VOR, N.R.		
RHEIS, G.M.		
JAMS, J. L.		
SUTLER, L.	X	X
BROUSSARD, M	X	X
McLaughlin, T	X	X
ROSENMAN, A.	X	X

COR. CONTROL	X	X
ADMN. RECORD		
PATS/130		

Reviewed for Addressee
Corres. Control RFP

2/26/02. KJ
Date By

Ref. Ltr. #

ORDER #
5400.1

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2002 FEB 26 A 9:31

CORRESPONDENCE
CONTROL

Colorado Department
of Public Health
and Environment

February 14, 2002

Joe Legare
Assistant Administrator for Environment and Infrastructure
U.S. Department of Energy-RFFO
10808 Highway 93, Unit A
Golden CO 80401-8200

RE: Approval of NFA designation for IHSSs and PACs

Dear Mr. Legare:

Since 1994 the Site has been proposing IHSSs and PACs for No Further Action (NFA) or No Further Remedial Action (NFRA) in the annual and quarterly Updates to the Historic Release Reports (HRR). No formal process was in place for the agencies to disposition the proposed NFA/NFRA sites. This fall an NFA Working Group developed and implemented a systematic approach for reviewing NFA/NFRA proposals in accordance with RFCA Attachment 6 and the Implementation Guidance Document. Using this systematic approach, 79 proposed sites were discussed during November and December 2001. It was agreed that 63 of the 79 sites meet the criteria for NFA/NFRA sites. This letter provides formal approval of these 63 sites listed in the attached table (Table 1). The remaining sixteen sites either require additional information, additional characterization, or limited remediation prior to approval as NFA/NFRA sites. Approved meeting minutes are located in the Site Project File and provide a record of discussions and agreements reached among the NFA Working Group members.

NFA meeting discussions also resulted in several corrections or clarifications to previous HRR Updates and associated correspondence. Some of the items are significant enough that they will be addressed in the 2002 Annual HRR Update. Other items only require documentation here in order to complete the process. Table 2 describes these clarifications and corrections.

If you have any questions please contact Gary Kleeman (EPA), 303-312-6246, Carl Spreng (CDPHE), 303-692-3358 or Reginald Tyler (DOE), 303-966-5927.

Sincerely,

Steven H. Gunderson
RFCA Project Coordinator
Colorado Department of Public
Health and Environment

Tim Rehder
Rocky Flats Project Manager
Environmental Protection Agency

Enclosure
cc w/Enc:
L. Butler, KH
M. Broussard, KH
R. Tyler, ERWM, RFFO
G. Kleeman, EPA
C. Spreng, CDPHE

List of Recently Approved NFAs
Table 1

IHSS	OU	PAC	DESCRIPTION	IDENTIFIED	UPDATED	APPROVED	NOTES
2001 Annual HRR Update							
133.3	5	SW-133.3	Ash Pit 3	HRR[1]	Annual 2001	12/5/01	
NA	5	SW-1701	Recently Identified Ash Pit (also referred to as TDEM-1)	Quarterly 9[13]	Annual 1997[3] Annual 2001	12/5/01	
NA	IA	100-603	Building 130 Diesel Spill	HRR[1]	Annual 2001	12/19/01	See edit in Table 2
NA	IA	400-812	Tank T-2 Spill in Building 460	Quarterly 6[16]	Quarterly 7[9] Quarterly 8[15] Annual 2001	12/19/01	
179	15	800-179	Building 865 Drum Storage	HRR[1]	Annual 1996[2] Annual 2001	12/19/01	
180	15	800-180	Building 883 Drum Storage	HRR[1]	Annual 1996[2] Annual 2001	12/19/01	
NA	IA	900-1308	Gasoline Spill Outside of Building 980	Quarterly 6[16]	Quarterly 8[15] Annual 2001	12/19/01	
2000 Annual HRR Update							
NA	BZ	NE-1409	Modular Tanks and 910 Treatment System Spill (formerly 000-503)	Quarterly 5[10]	Quarterly 7[9] Annual 2000[26]	11/14/01	
156.1	IA	300-156.1	Building 371 Parking Lot (2 locations designated on Plate #2)	HRR[1]	Annual 1997[3] Annual 2000[26]	11/14/01	

List of Recently Approved NFAs
Table 1

IHSS	OU	PAC	DESCRIPTION	IDENTIFIED	UPDATED	APPROVED	NOTES
164.1	IA	900-164.1	Radioactive Slab from Bldg. 776	HRR[1]	Annual 1997[3] Annual 2000[26]	11/14/01	See edit in Table 2 Will also be updated in 2002 HRR
NA	IA	600-1001(a)	Waste Oil Identified in PAC-100	Annual 1997[3]	Annual 1997[3] Annual 2000[26]	11/14/01	See edit in Table 2
123.1	IA	700-123.1	Valve Vault 7	HRR[1]	Annual 1997[3] Annual 2000[26]	11/14/01	
108	BZ	900-108	Trench T-1	HRR[1]	Annual 1997[3] Annual 1998[7] Annual 2000[26]	11/14/01	
NA	IA	900-1311	Septic Tank East of Building 991	Quarterly 7[9]	Annual 1999[23] Annual 2000[26]	11/14/01	
NA	IA	900-1318	Release of F001 Listed Waste Water to Soil (identified as 900-1307 in Annual 1997; reassigned 900-1318 in Annual 1998)	Annual 1997[3]	Annual 1998[7] Annual 2000[26]	11/14/01	
181	BZ	900-181	Gas Detoxification Area	HRR[1]	Annual 1997[3] Annual 2000[26]	11/14/01	Will be updated in 2002 HRR
110	BZ	NE-110	Trench 3	HRR[1]	Annual 1996[2] Annual 1997[3] Annual 2000[26]	11/14/01	Will be updated in 2002 HRR

List of Recently Approved NFAs
Table 1

IHSS	OU	PAC	DESCRIPTION	IDENTIFIED	UPDATED	APPROVED	NOTES
1996 Annual HRR Update							
166.1	6	NE-166.1	Trench A	HRR[1]	Annual 1996[2]	11/14/01	
166.2	6	NE-166.2	Trench B	HRR[1]	Annual 1996[2]	11/14/01	
166.3	6	NE-166.3	Trench C	HRR[1]	Annual 1996[2]	11/14/01	
167.2	7	NE-167.2	Pond Area Spray Field (Center Area)	HRR[1]	Annual 1996[2]	11/14/01	
167.3	7	NE-167.3	South Area Spray Field	HRR[1]	Annual 1996[2]	11/14/01	
216.1	6	NE-216.1	East Spray Fields - North Area	HRR[1]	Annual 1996[2]	11/14/01	
204	15	400-204	Original Uranium Chip Roaster	HRR[1]	Annual 1996[2]	11/14/01	
158	IA	500-909	Release of Spent Photographic Fixer Solution	Annual 1996[2]	-	11/14/01	
Quarterly HRR Update 7							
114	7	NW-1502	Improper Disposal of Diesel-Contaminated Material at Landfill (formerly NW-177)	Quarterly 2[5]	Quarterly 3[6] Quarterly 7[9]	12/19/01	

List of Recently Approved NFAs
Table 1

IHSS	OU	PAC	DESCRIPTION	IDENTIFIED	UPDATED	APPROVED	NOTES
114	7	NW-1503	Improper Disposal of Fuel Contaminated Material at Landfill	Quarterly 1[24]	Quarterly 7[9]	12/19/01	
Sites approved by EPA in 1992; awaiting CDPHE concurrence.							
NA	BZ	NE-1400	Tear Gas Powder Release	HRR[1]	-	12/19/01	
NA	BZ	NE-1401	NE Buffer Zone Gas Line Break	HRR[1]	-	11/14/01	
NA	BZ	NE-1402	East Inner Gate PCB Spill	HRR[1]	-	11/14/01	
NA	BZ	NE-1403	Gasoline Spill - Building 920 Guard Post	HRR[1]	-	11/14/01	
NA	BZ	SW-1700	Fuel Spill into Woman Creek Drainage	HRR[1]	-	11/14/01	
NA	BZ	000-501	Roadway Spraying	HRR[1]	-	12/19/01	
NA	IA	100-600	Mercury Spill – Valve Vault 124-B, Building 124	HRR[1]	-	12/19/01	
NA	IA	100-601	Building 123 Phosphoric Acid Spill	HRR[1]	-	11/14/01	
NA	IA	100-604	T130 Complex Sewer Line Leaks	HRR[1]	-	11/14/01	

List of Recently Approved NFAs
Table 1

IHSS	OU	PAC	DESCRIPTION	IDENTIFIED	UPDATED	APPROVED	NOTES
NA	IA	100-605	Building 115 Hydraulic Oil Spill	HRR[1]	-	11/14/01	
NA	IA	100-606	Building 125 TCE Spill	HRR[1]	-	11/14/01	
NA	IA	100-610	Asbestos Release – Building 123	HRR[1]	-	11/14/01	
NA	IA	100-612	Battery Solution Spill - Building 119	HRR[1]	-	11/14/01	
NA	IA	300-700	Scrap Roofing Disposal	HRR[1]	-	11/14/01	
NA	IA	300-701	Sulfuric Acid Spill – Building 371	HRR[1]	-	11/14/01	
NA	IA	300-703	Building 331 North Area	HRR[1]	-	11/14/01	
NA	IA	300-704	Roof Fire, Building 381	HRR[1]	-	11/14/01	
NA	IA	300-705	Potassium Hydroxide Spill North of Building 374	HRR[1]	-	11/14/01	
NA	IA	300-706	Evaporator Tanks North of Building 374	HRR[1]	-	11/14/01	

List of Recently Approved NFAs
Table 1

IHSS	OU	PAC	DESCRIPTION	IDENTIFIED	UPDATED	APPROVED	NOTES
NA	IA	300-707	Sanitizer Spill	HRR[1]	-	12/19/01	
NA	IA	300-710	Gasoline Spill North of Building 331	HRR[1]	-	11/14/01	
NA	IA	400-805	Building 443 Tank #9 Leak	HRR[1]	-	12/5/01	
NA	IA	400-806	Catalyst Spill, Building 440	HRR[1]	-	11/14/01	
NA	IA	400-808	Vacuum Pump Leak - Building 442	HRR[1]	-	11/14/01	
NA	IA	400-809	Oil Leak - 446 Guard Post	HRR[1]	-	11/14/01	
NA	IA	500-903	RCRA Storage Unit #1	HRR[1]	-	11/14/01	
NA	IA	700-1107	Compressor Waste Oil Spill - Building 776	HRR[1]	-	11/14/01	
NA	IA	700-1109	Uranium Incident - Building 778	HRR[1]	-	11/14/01	
NA	IA	800-1202	Sulfuric Acid Spill, Building 883	HRR[1]	-	11/14/01	

List of Recently Approved NFAs
Table 1

IHSS	OU	PAC	DESCRIPTION	IDENTIFIED	UPDATED	APPROVED	NOTES
NA	IA	800-1203	Sanitary Sewer Line Break Between Buildings 865 and 886	HRR[1]	-	11/14/01	
NA	IA	800-1206	Fire, Building 883	HRR[1]	-	11/14/01	
NA	IA	800-1211	Capacitor Leak, Building 883	HRR[1]	-	11/14/01	
NA	IA	900-1302	Gasoline Spill	HRR[1]	-	11/14/01	
NA	IA	900-1303	Natural Gas Leak	HRR[1]	-	11/14/01	
NA	IA	900-1304	Chromic Acid Spill - Building 991	HRR[1]	-	11/14/01	
NA	IA	900-1305	Building 991 Roof	HRR[1]	-	11/14/01	

TABLE 2: Clarifications to documentation associated with recently approved NFA/NFRA sites

YEAR	PAC	TITLE	CORRECTION / CLARIFICATION
2000	600-164.1	B771 Radioactive Slab	Appendix 1, pg 124: The correct title should read *Radioactive Slab from Building 771.*
2000	600-1001(a)	Waste Oil in PAC 1001	Page 47: As stated; PAC 600-1001 *will be* investigated. It is only the waste oil spill identified as 600-1001(a) which was cleaned up upon discovery that is agreed to as NFA.
2000	100-607	B111 Transformer PCB Leak	As way of clarification to a statement in the October 2, 2001 CDPHE letter stating that the Site had not proposed this PAC as a potential NFA; This PAC was not proposed in the 2001 Annual Update to the HRR because PAC 600-607 was approved NFA via separate letter dated April 12, 2001, and required no further evaluation.
2001	100-603	B123 Bioassay Waste Spill	Clarification is required due to confusion over the write-up provided under Description of Operation or Occurrence and Physical/Chemical Description Constituent Released in the 2001 HRR. The release was contained with-in the trench and 8 feet of the building with berms as confirmed by sampling. Based on this, rainwater being pumped from the trench at the time of the release at locations greater than 8 feet from the building and both south and southeast of the building was not contaminated by the release. The contaminated rainwater contained with-in the bermed area of the trench totaled approximately 100 gallons and was neutralized, pumped and treated at 374.

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
ER REGULATORY CONTACT RECORD

Date/Time:	May 1, 2003/ 9 am
Site Contact(s):	Norma Castaneda, Reg Tyler, DOE RFFO Chad Blake, Nick Demos, Gerry Kelly, Annette Primrose, KH Team
Phone:	303 966-4226, 303 966-5927
Regulatory Contact:	Gary Kleeman, EPA Harlen Ainsough, Elizabeth Pottorff, CDPHE
Phone:	303 312-6246, 303 692-3327, 303 692-3429
Agency:	EPA and CDPHE

Purpose of Contact: Develop Characterization Plan for the Incinerator

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Discussion
A meeting was held at 9am on Thursday, May 1, 2003 to discuss the path forward for the newly discovered Incinerator. Based on these discussions, and a site visit of the groundwater seeps, following are the agreed upon characterization approach and hold points. Also included are additional data requested at the meeting. Groundwater data from nearby wells will be provided by May 12th along with existing data from the nearby borehole.

Background information

IHSS 133.6 – Concrete Wash Area was an area used during plant construction to washout concrete trucks prior to leaving Site. Excess, clean concrete up to 5 feet thick is present in some locations and is being removed as a Best Management Practice. Because the concrete is not contaminated, this activity is not a remedial action. As described in the Contact Record dated March 17, 2003, samples were collected under the excess concrete on March 17, 2003 to close out the IHSS.

The former incinerator, IHSS 133.5, was known to be in this area based on old aerial photos. The exact location could not be determined because the concrete washout in this area is up to 8 feet thick. It was suspected that the Incinerator slab, or portions of the Incinerator structure, might still be present, so excavation began in the area where the slab was expected first. Sampling was planned for this area even if the slab was not found, to determine if a release to the environment had occurred due to incinerator operations. The slab was not found at the expected location and samples were collected on April 16, 2003 as described in the Contact Record dated March 17, 2003.

On April 24th, while concrete removal was underway at this IHSS, the southern face of the Incinerator was uncovered sufficiently enough to be identified. The incinerator is built into the hillside and it appears that, based on old photos, the structure was partially backfilled along the north, east and west sides at that time. The 1952 engineering drawings indicate that the slab thickness is 1' 3". No utilities are shown on the drawings, and recent interviews with several workers indicate that the materials within the Incinerator were lit using a propane torch or matches.

Because it was found on the last working day of the week and rain was forecast for the weekend, the excavation was partially backfilled to keep precipitation away from the Incinerator and to allow the excavation to drain. About the upper 10 feet of Incinerator was left exposed. The roof had been buried by about a foot of soil, and about half the roof area was exposed. Radiological surveys of part of the outside surfaces of the Incinerator and the equipment were performed and were negative.

Additional radiological surveys of the exposed Incinerator sides and roof were performed on Monday, April 26th. A slightly elevated area was found on the roof near the former location of the Incinerator Stack. Activities at this area were detectable but well below action limits (i.e. this material is free releasable).

Unrelated to the Incinerator, lab debris with elevated beta radiation was discovered about 300 feet south of the Incinerator on May 1, 2003. The Historical Release Report for the area describes that noncombustible glassware and trash was collected in a nearby dumpster, so this type of material was not unexpected. The immediate area where the trash was found is posted as a radioactive material area and the material will be removed and disposed as waste.

Characterization Approach

The following sampling approach was developed to ensure that there were sufficient controls on the sampling process to proceed without requiring a SAP Addendum. In addition to the sampling effort, groundwater data from nearby wells will be provided for use in the decision making process.

1) Sample roofing material for asbestos. The exposed roof is covered with roofing materials. The sampling was completed on April 24th and this material was found to be 20% asbestos containing material (ACM).

2) Obtain soil samples of the fill material on top of and surrounding the incinerator. The origin of the fill dirt is unknown and the samples will be analyzed for radionuclides, metals and volatile organic compounds (VOCs) in the onsite lab. Samples were collected on April 29th. Results are expected by May 2nd. Preliminary gamma spec results do not show elevated radioactivity. Semi volatile organic compound (SVOC) samples were also collected and will be analyzed offsite with results expected in 2 weeks.

3) **Hold Point** – No additional sampling activities will proceed until the radionuclide, metals and VOC soil sample results are received. If soil results are below action levels, then excavation of the Incinerator will proceed to allow additional sampling. SVOC results will not delay the following activities. The excavated soil will remain in the immediate area. If soil samples are above action levels, then a decision on how to proceed will be made in consultation with the regulators. If only the soil on top of the incinerator is above action levels, then excavation of the sides may proceed without disturbing these soils. The excavation process follows, although it may be modified in response to field conditions.

4) To avoid hazards from falling soil and other materials, the soil will be removed from the top of incinerator first using manual methods, exposing roofing materials and any potential hazards associated with the former stack and hopper locations. Qualified asbestos workers will remove roofing materials and this waste will be disposed offsite as ACM. If hazards exist, mitigate as necessary. Verify the type of fill material, if any is present, at the former stack and hopper locations.

5) Excavate the south side of incinerator, including the southernmost portions of the east and west walls that were exposed when the Incinerator was operating. Be alert for the presence of ash in the fill material and be prepared to segregate and sample as necessary.

6) As evident from the original construction photos, a fire door or similar opening is present about half way down the Incinerator. When the fire door is exposed on the west side, stop excavating, leaving a safe access for a sampler to the door. Open or remove door as

required. Take photographs as possible. No entry into the Incinerator will be allowed. Samples will be collected as follows:

a) Beryllium and rad swipes will be collected from inside the Incinerator by a sampler wearing a full-face respirator and using a pole or other extension device.

b) Collect soil/ash samples if present using an extension device. Analyze at the onsite lab to get quick-turnaround total metals and radionuclides results. Additional samples will be collected if needed to satisfy waste acceptance criteria.

c) Collect firebrick or asbestos containing materials as possible for offsite asbestos analysis and onsite metals and radionuclide analysis.

d) When sampling is complete, the door will be closed or the opening otherwise sealed if the opening will be left exposed for extended periods.

7) Excavate to near the original ground surface, exposing the two openings on the south side of the Incinerator in a manner that safely allows sampler access to these openings. Obtain radiological and beryllium swipes, photographs and soil/ash samples as described in item 6 above. When sampling is complete, the door will be closed or the opening otherwise sealed.

8) Excavate along the southernmost portions of the east and west walls that were exposed when the Incinerator was operating. Be alert for the presence of ash material in the fill dirt and be prepared to segregate as necessary. For samples proposed east and west of the Incinerator, locate the most likely sample locations, potentially using the lower wing walls shown on the 1952 Engineering Drawings for guidance. As possible, excavate along the slope shown in earlier photos. Two samples are planned for the east side of the Incinerator and one on the west side as per the attached sketch map. However, actual sample locations may vary depending on field conditions and the presence of ash or staining.

9) Continue excavating to expose the original road surface south of the Incinerator. Ground surface elevations are available from the 1952 Engineering Drawings and will be used to guide the excavation. As above, two samples are planned to be collected from the area in front of the Incinerator including soils from directly beneath the ash trays/chutes. However, sample locations will be biased to the areas with the most evidence or likelihood of potential contamination from ash or other spills. The attached sketch map shows the proposed locations although the actual field locations will be biased to areas with visible staining or other indications of ash storage.

   a) Analyze the soil samples for radionuclides, metals, VOCs, and dioxins/furans.

      i) Samples will be analyzed onsite for radionuclides and VOCs.

      ii) Metal samples will be sent offsite for full suite totals analyses including beryllium.

      iii) Dioxin/furan samples will be analyzed offsite using method 8290. This analysis method is currently available to the project and will more quickly provide information on the presence or absence of the dioxins and furans but will not provide additional information on the presence or absence of the congeners. Results will indicate the presence of these compounds, indicate whether a remedial action is required, and indicate whether additional analyses are required.

   b) Additional samples may be required depending on the results and will be determined using the consultative process.

10) As soon as possible, collect seep samples from two downgradient seeps identified in the walkdown on May 1, 2003. One seep location has a slotted pipe that can be used for sampling, the other does not. Water samples will be analyzed for radionuclides by gamma spectroscopy, and total metals.

11) Perform radiological surveys of the exterior surfaces of the Incinerator sufficiently for waste characterization.

12) **Hold Point-** No further activities will occur until results are received and discussed with the regulatory agencies. Based on the data, the decision will be made on how to disposition the Incinerator.

   a) At this time, it is anticipated that all portions of the incinerator will be removed that were once in contact with ash. The footings and wing walls may be left in place if uncontaminated.

   b) Depending on the sampling results, additional groundwater wells or surface water sampling may be required.

   c) A data summary or similar report will be developed with the results of the path forward approach along with an explanation of why this approach was taken.

Contact Record Prepared By: Annette Primrose

Required Distribution:

S. Bell, RFFO
L. Brooks, K-H ESS
L. Butler, K-H RISS
C. Deck, K-H Legal
R. DiSalvo, RFFO
S. Gunderson, CDPHE
J. Legare, RFFO
N. Castaneds, RFFO
R. Tyler, RFFO
D. Mayo, K-H RISS
J. Mead, K-H ESS
S. Nesta, K-H RISS
K. North, K-H ESS
T. Rehder, USEPA
D. Shelton, K-H
C. Spreng, CDPHE

Additional Distribution (choose names as applicable):
M. Broussard, K-H RISS
J. Hindman, CDPHE
G. Kleeman, USEPA
D. Kruchek, CDPHE
L. Norland, K-H RISS
A. Primrose, K-H RISS
E. Pottorff, CDPHE
H. Ainscough, CDPHE
N. Demos, K-H RISS
M. Bemski, K-H RISS
D. Strand, K-H RISS

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
ER REGULATORY CONTACT RECORD

Date/Time:	May 13, 2003/12:15 pm
Site Contact(s):	Norma Castaneda, DOE RFFO Nick Demos, Annette Primrose, KH Team
Phone:	303 966-4605, 303 966-4385
Regulatory Contact:	Gary Kleeman, EPA Harlen Ainsough, Elizabeth Pottorff, CDPHE
Phone:	303 312-6246, 303 692-3327, 303 692-3429
Agency:	EPA and CDPHE

Purpose of Contact: Initial Sampling Requirements Identified within the Characterization Plan for the Incinerator as Stated in RCR May 1, 2003

A Regulatory Contact Record (RCR) was sent out on May 1, 2003 discussing the path forward for the Incinerator Site (IHSS 133.5). This RCR is being sent to document fulfillment of initial sampling requirements thereby allowing work to resume (i.e., excavation of the surrounding soils and further characterization efforts).

This RCR documents the discussions held on May 12 and 13th, 2003, that all initial sampling has been completed in accordance with the May 1, 2003 RCR. Three soil sample locations were identified to characterize the fill material on top of and surrounding the incinerator. Two samples from the material placed on top of the Incinerator and one sample from a lower area adjacent to the south-west side of the structure. The samples were analyzed for radionuclides (gamma spectroscopy), total metals (both XRF and 8260), VOCs and Semi VOCs. All of the data has been compared to and is below the Wildlife Refuge Worker Action Levels.

The project is preparing to resume work in accordance with the May 1, 2003, RCR.

Required Distribution:

S. Bell, RFFO
L. Brooks, K-H ESS
L. Butler, K-H RISS
C. Deck, K-H Legal
R. DiSalvo, RFFO
S. Gunderson, CDPHE
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H. Ainscough, CDPHE
N. Demos, K-H RISS
M. Bemski, K-H RISS
D. Strand, K-H RISS
C. Blake, K-H RISS

Reeder, Daniel

From: Primrose, Annette
Sent: Monday, June 30, 2003 6:46 AM
To: Brooks, Laura
Cc: Broussard, Marcella
Subject: Paragraph on Incinerator

More than a paragraph. Hope it meets your needs.

During removal of excess, clean concrete from an area used during plant construction to washout concrete trucks prior to leaving Site, the former Incinerator, IHSS 133.5, was found on April 24, 2003. It was suspected that the Incinerator slab, or portions of the Incinerator structure, might still be present in this area, however, the exact location could not be determined because the concrete washout in this area is up to 8 feet thick.

The incinerator is built into the hillside and it appears that, the structure was partially backfilled along the north, east and west sides while it was operating. After it was abandoned, the rest of the structure was covered with fill, then clean excess concrete was poured over it and much of the surrounding area as part of the washout operations.

Radiological surveys of the exposed Incinerator sides and roof were performed and activities were detectable but well below action limits (i.e. this material is free releasable). Beryllium swipes were below action levels except those taken immediately within the lower ash chutes. Soil samples collected adjacent to the Incinerator were also below action levels. Soil/ash samples and radiological surveys from within the lower ash chutes indicate depleted uranium is present above action levels. An approach is being developed to safely remove the Incinerator either late this fiscal year or early in FY04.

Annette Primrose
4385 cell (303) 994-2761

99

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
ER REGULATORY CONTACT RECORD

Date/Time:	10-22-03/ 12:15
Site Contact(s):	Annette Primrose
Phone:	303 966-4385
Regulatory Contact:	Gary Kleeman
Phone:	303 312-6246
Agency:	EPA

Purpose of Contact: Incinerator confirmation samples

Discussion

As was previously agreed upon, two additional confirmation samples will be collected from beneath the Incinerator slab when it is removed. The confirmation sample analytical suite is:

- Radionuclides
- Metals (including Be and Li)
- Dioxins/Furans
- VOCs

If radionuclide and metal results are below action levels, then backfill will be permitted. The radionuclides will be analyzed using gamma spectroscopy.

Contact Record Prepared By: Annette Primrose

Required Distribution

S. Bell, RFFO
J. Berardini, K-H
L. Brooks, K-H ESS
M.Broussard, K-H RISS
L. Butler, K-H RISS
G. Carnival, K-H RISS
N. Castaneda, RFFO
C. Deck, K-H Legal
R. DiSalvo, RFFO
S. Gunderson, CDPHE
M. Keating, K-H RISS
G. Kleeman, USEPA
D. Kruchek, CDPHE
D. Mayo, K-H RISS
R. McCalister, DOE
J. Mead, K-H ESS
S. Nesta, K-H RISS
L. Norland, K-H RISS
K. North, K-H ESS
E. Pottorff, CDPHE
A. Primrose, K-H RISS
T. Rehder, USEPA
S. Serreze, RISS
D. Shelton, K-H
C. Spreng, CDPHE
S. Surovchak, RFFO
K. Wiemelt, K-H RISS
C. Zahm, K-H

Additional Distribution
(choose names as applicable):

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
ER REGULATORY CONTACT RECORD

Date/Time:	November 12, 2003/ 4:35 pm	
Site Contact(s):	Annette Primrose	Norma Castaneda
Phone:	303 966-4385	303 966-4226
Regulatory Contact:	Gary Kleeman	
Phone:	303 312-6246	
Agency:	EPA	

Purpose of Contact: Permission to backfill at the Incinerator (SW-1)

Discussion

As described in the October 22nd contact record, the decision to backfill at the Incinerator will be made based on the results of the confirmation sample gamma spectroscopy and metals results. These results were received and all are below the Wildlife Refuge Worker action levels. Based on this, backfill is permitted.

In addition, it was discussed that three concrete structures will remain; the footer under the northern wall, and the two caissons that were located under the incinerator where the southern wing walls joined this structure. None of these remaining strucures were in contact with ash and all will be greater than 3 feet below grade after final regrading.

As later discussed on November 13, 2003, a small amount of native fill was removed from the very top of the incinerator. Sample results for this material were below the Wildlife Refuge Worker action levels and it was agreed that this material could also be used as backfill.

Contact Record Prepared By: Annette Primrose

Required Distribution:

S. Bell, RFFO
L. Brooks, K-H ESS
L. Butler, K-H RISS
C. Deck, K-H Legal
R. DiSalvo, RFFO
S. Gunderson, CDPHE
J. Legare, RFFO
D. Mayo, K-H RISS
J. Mead, K-H ESS
S. Nesta, K-H RISS
K. North, K-H ESS
T. Rehder, USEPA
D. Shelton, K-H
C. Spreng, CDPHE

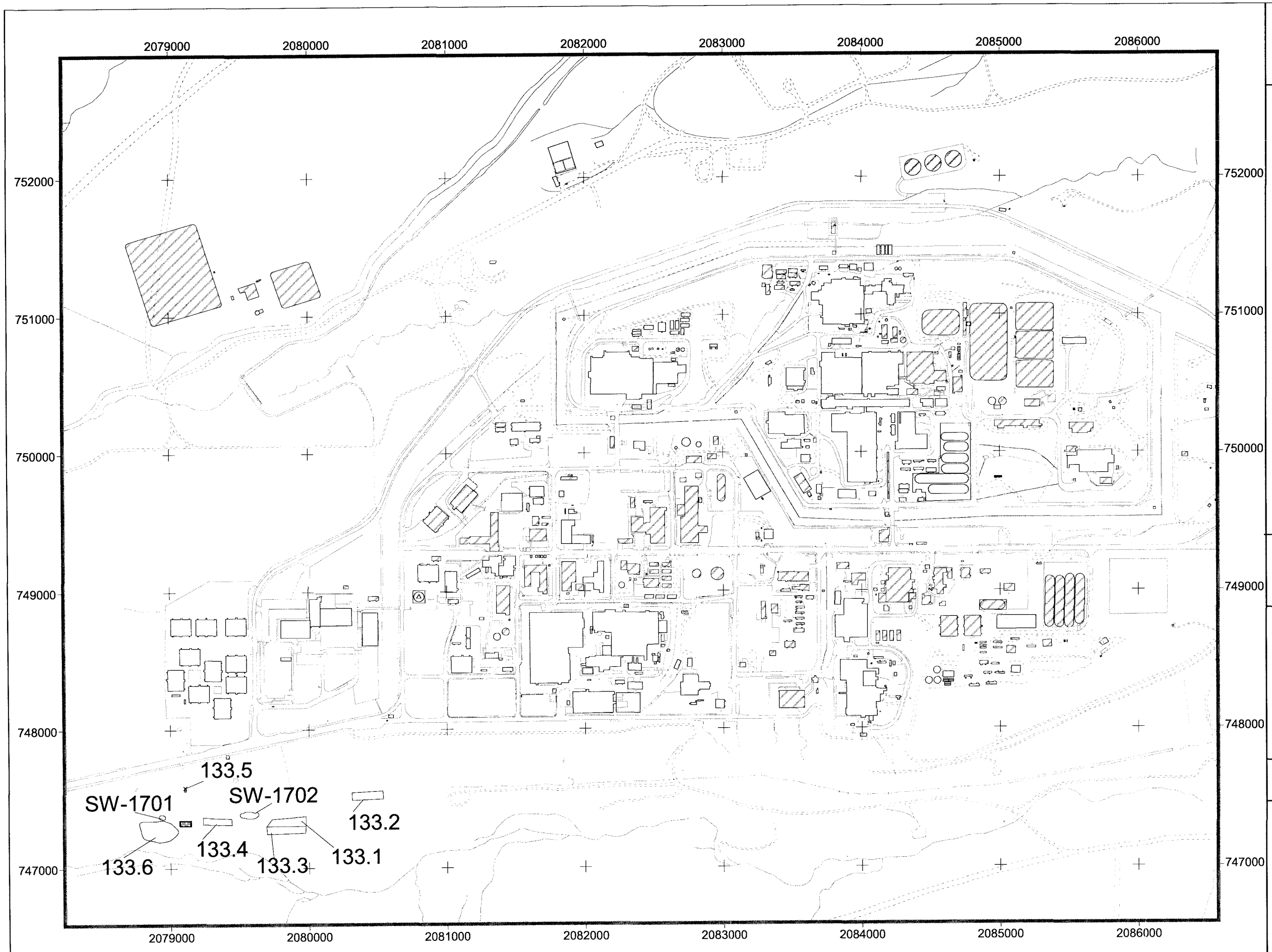
Additional Distribution (choose names as applicable):

M. Broussard, K-H RISS
J. Hindman, CDPHE
G. Kleeman, USEPA
D. Kruchek, CDPHE
L. Norland, K-H RISS
A. Primrose, K-H RISS
E. Pottorff, CDPHE
S. Tower, DOE

COMPLETE DATA SET COMPACT DISC

ACCELERATED ACTION DATA

Figure 1
IHSS Group SW-1 Location



KEY

- IHSS
- PAC
- Streams
- Dirt Road
- Paved Road

Building:

- Demolished
- Standing
- Approximate Location of Concrete Debris
- Estimated Location of Incinerator
- Potential Air Monitoring Location

N
W E
S

500 0 500 Feet

Scale = 1:10,000

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: Date: November 2003

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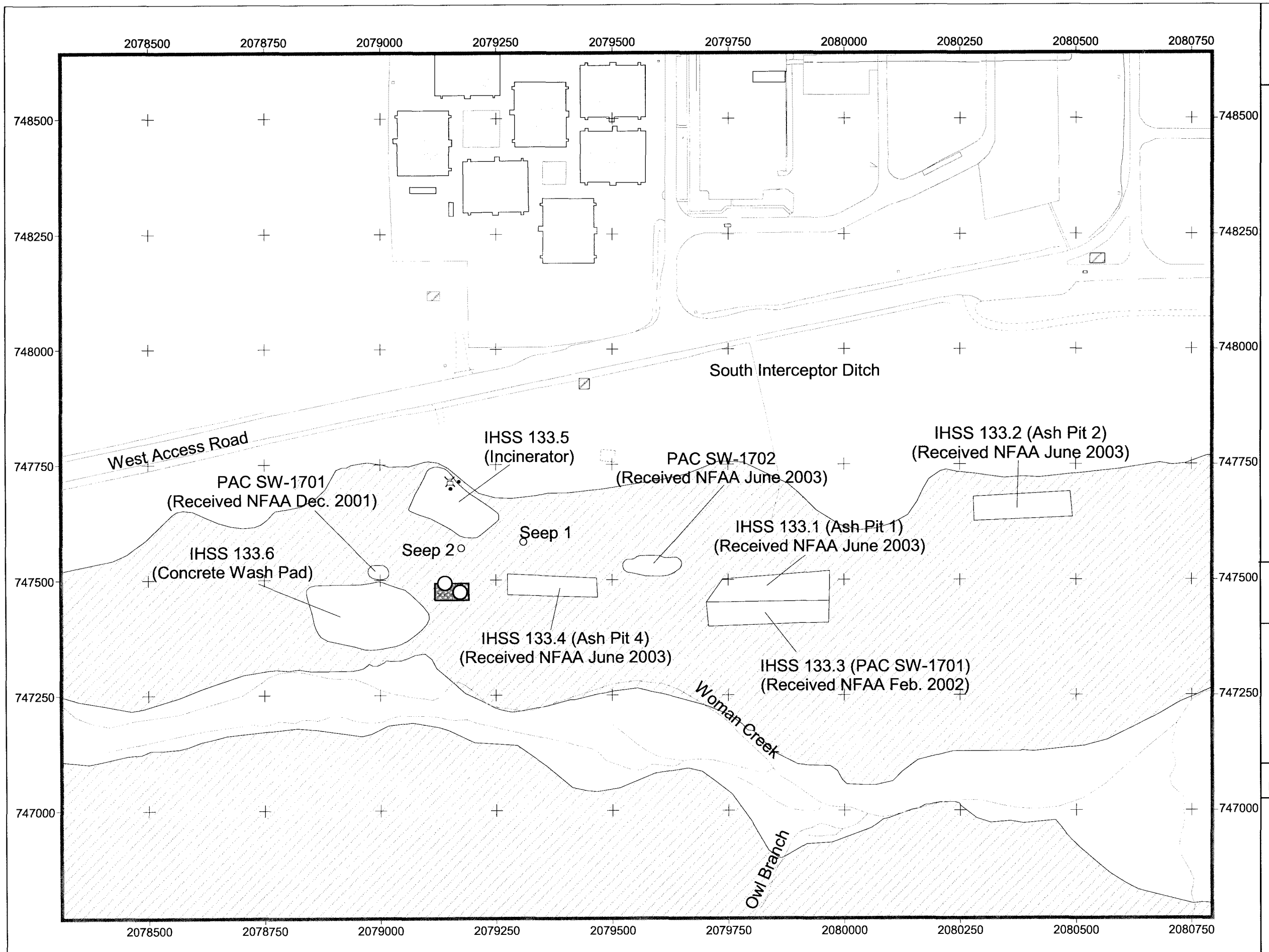
REMEDIAL ACTION DECISION MANAGEMENT SYSTEM

KAISER•HILL COMPANY

File: w:\projects\fy2004\SW-1\SW-1_dlrpt_dcr.apr

Figure 2
IHSS Group SW-1
IHSS and PAC Sites



KEY

- IHSS 133.5
- IHSS
- PAC
- Area Prone to High Erosion and Landslides
- Prebble Jumping Mouse Critical Habitat
- Streams
- Dirt Road
- Paved Road

Building:

- Demolished
- Standing
- Approximate Location of Concrete Debris
- Estimated Location of Incinerator
- Approximate Location of Laboratory Debris
- Seep Sampling Location

N W E S

100 0 100 200 Feet

Scale = 1:2500
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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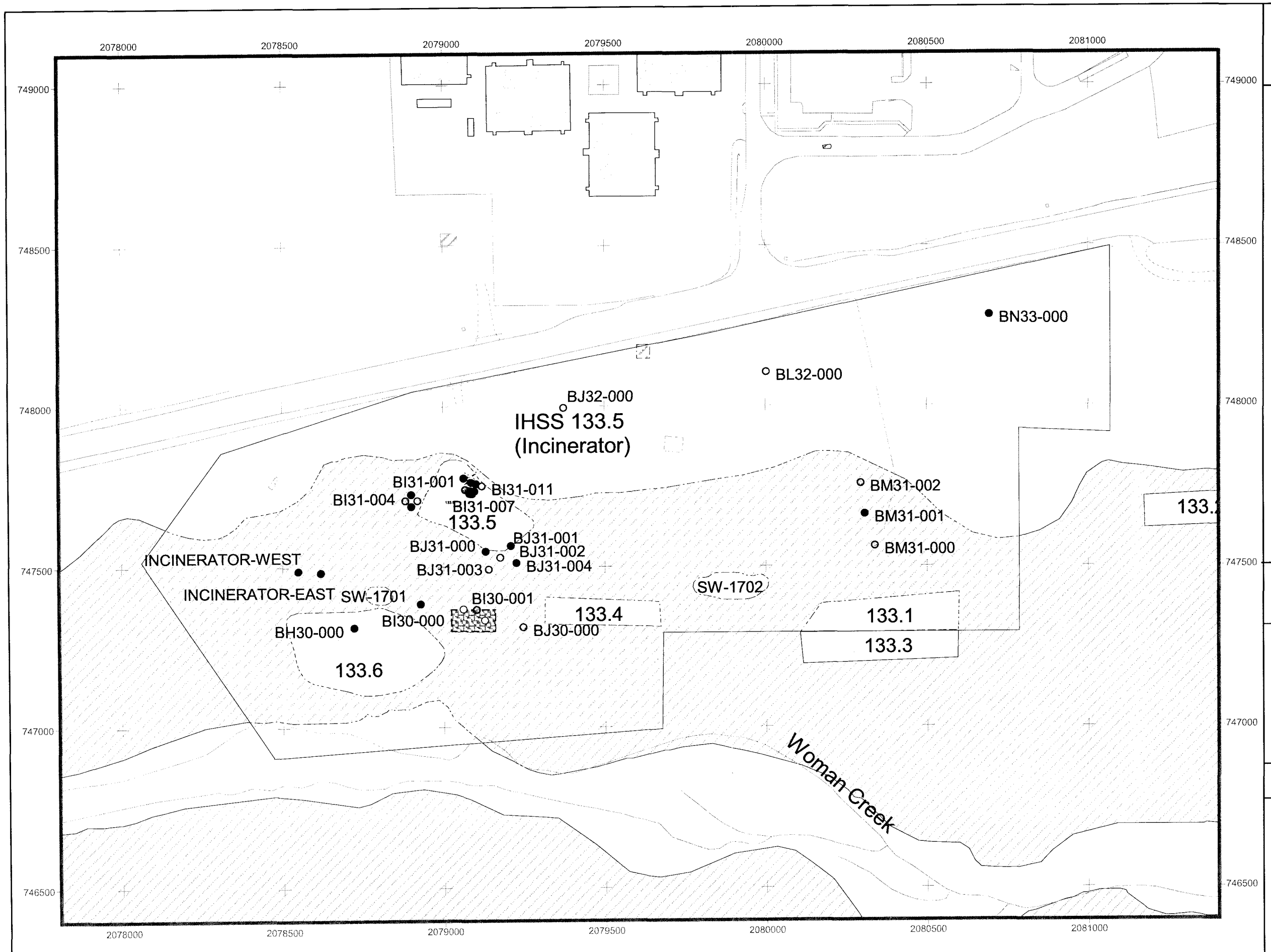
File: w:\projects\fy2004\SW-1\SW-1_clrpt_dcr.apr

Figure 4
IHSS Group SW-1
Area of Concern



KEY

- Samples Greater Than Ecological Receptor Action Levels
- Samples Less Than Ecological Receptor Action Levels, But Greater Than Background
- Samples Less Than Background
- Area of Concern
- Potential Remediation Area
- IHSS
- PAC
- Area Prone to High Erosion and Landslides
- Streams
- Dirt Road
- Paved Road

Building:

- Demolished
- Standing
- Approximate Location of Concrete
- Approximate Location of Laboratory Debris
- Estimated Location of Incinerator

N W E S

100 0 100 200 Feet

Scale = 1:2,000
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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File: w:\projects\fy2004\SW-1\SW-1_clrpt_dcr_2.apr

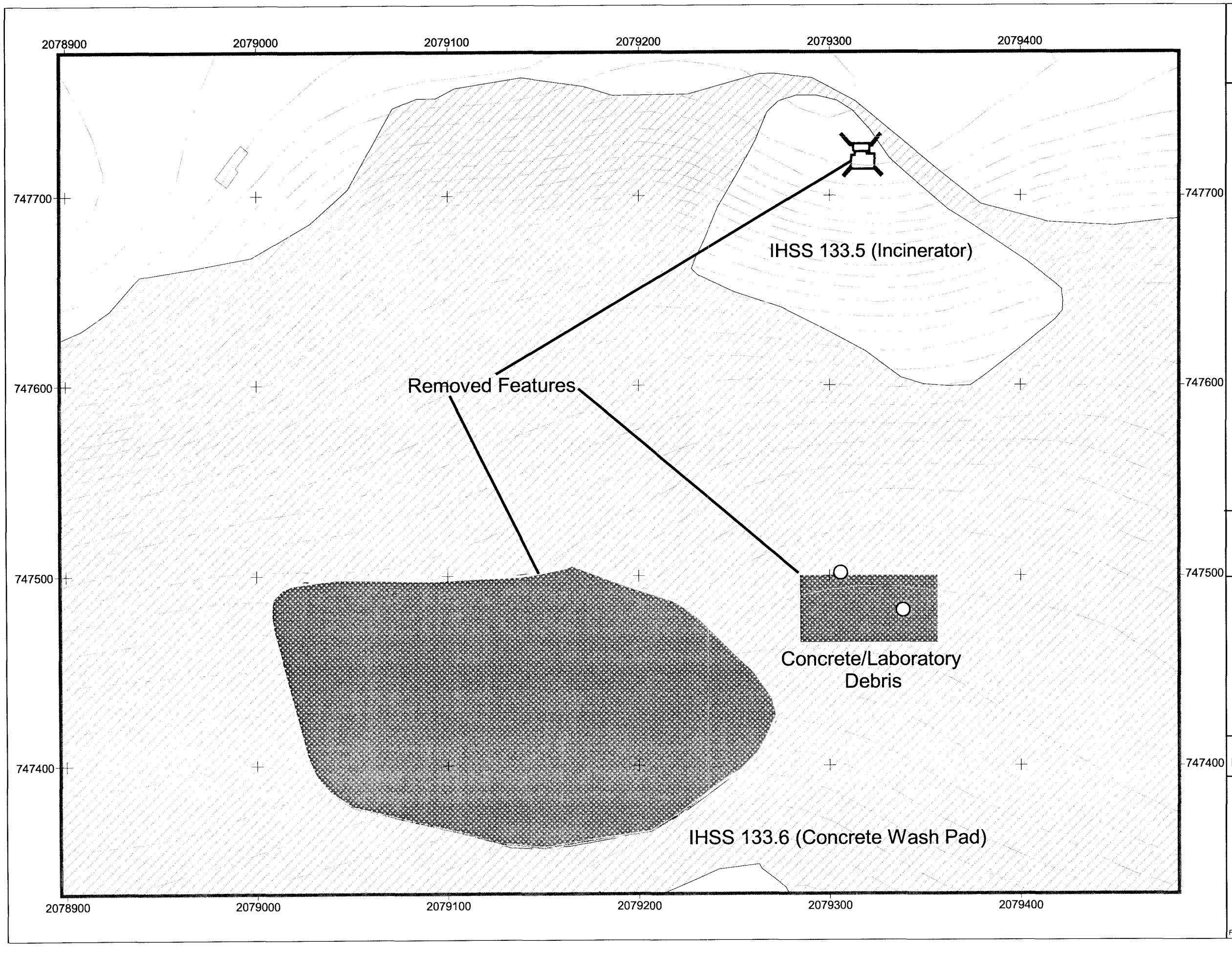

Figure 5
IHSS Group SW-1
Removed Features

KEY

- Area Prone to High Erosion and Landslides
- Contour (2 foot interval)
- Approximate Location of Concrete Debris
- Removed Features
- Approximate Location of Laboratory Debris

N
W E
S

25 0 25 50 75 Feet

Scale = 1:500

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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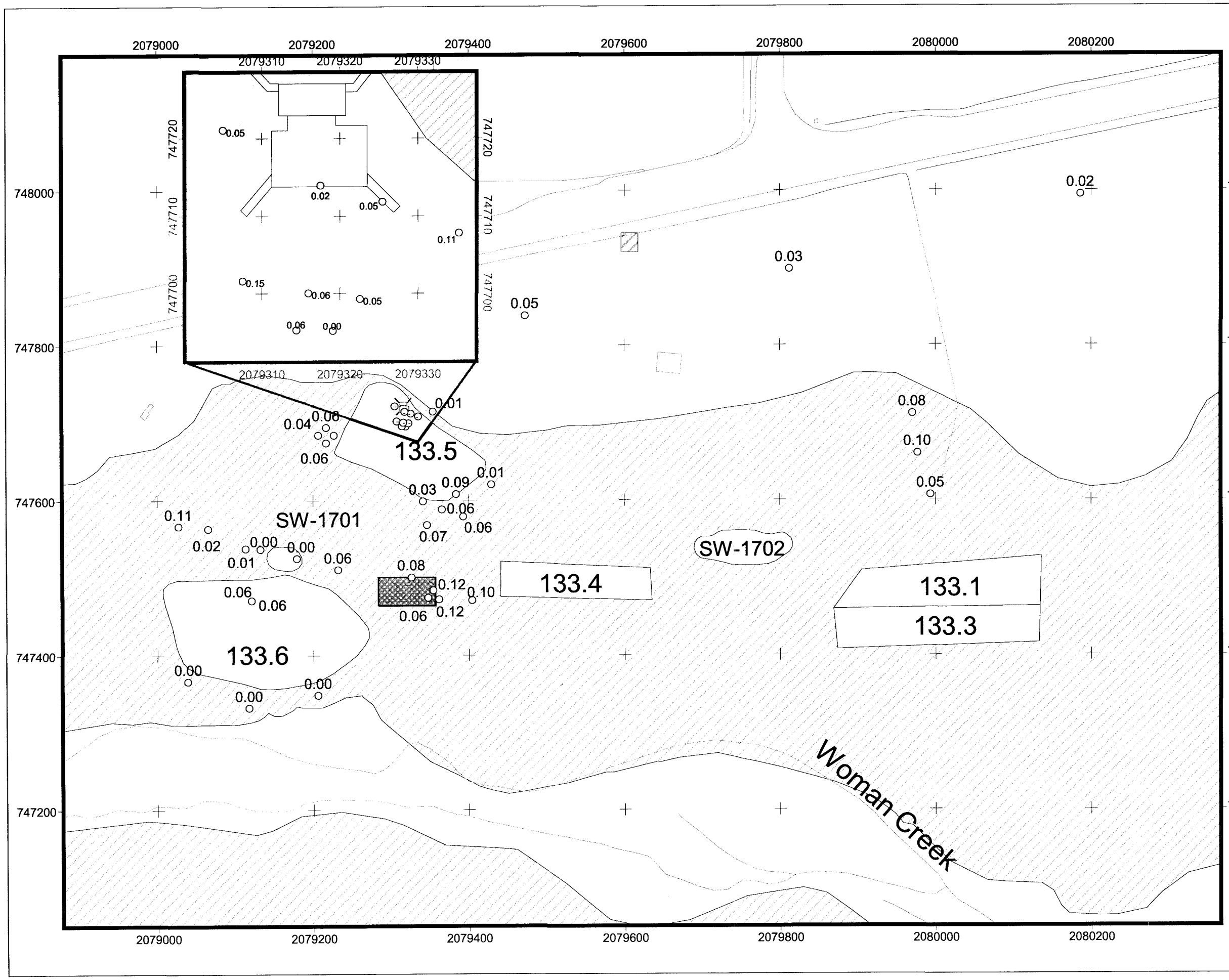
File: w:\projects\fy2004\SW-1\SW-1_clrpt_dcr.apr

Figure 7
Sum of Ratios at IHSS Group SW-1



KEY

- IHSS 133.5
- IHSS
- PAC
- Area Prone to High Erosion and Landslides
- Prebble Jumping Mouse Critical Habitat
- Streams
- Dirt Road
- Paved Road
- Demolished
- Standing
- Approximate Location of Concrete Debris
- Estimated Location of Incinerator
- Sampling Location

N
W E
S

60 0 60 120 Feet

Scale = 1:1500

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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File: w:\projects\fy2004\SW-1\SW-1_clrpt_dcr.apr

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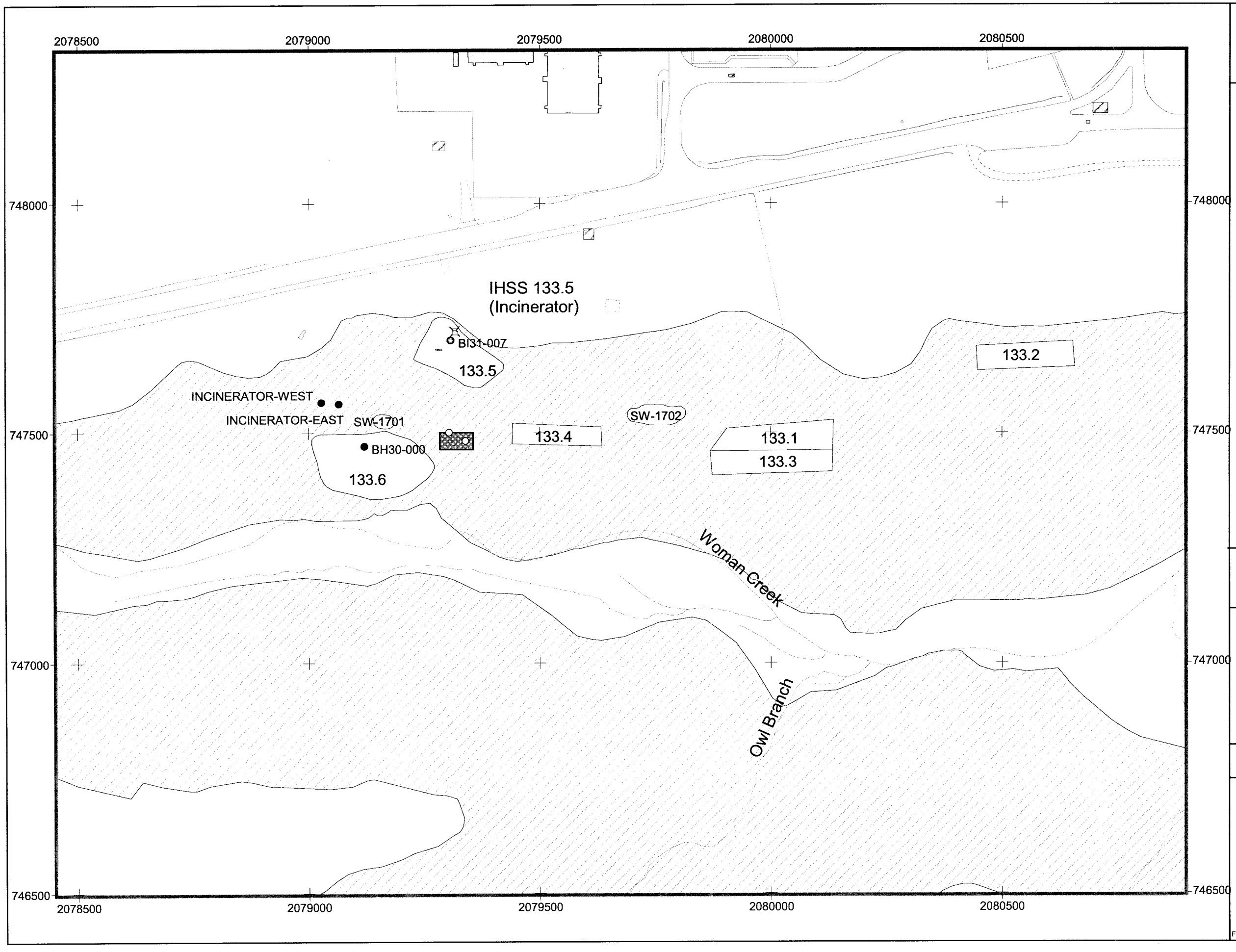
Figure 8
No Longer Representative Sampling Locations



KEY

- Samples Greater Than Ecological Receptor Action Levels
- Samples Less Than Ecological Receptor Action Levels, But Greater Than Background
- Samples Less Than Background
- Potential Remediation Area
- IHSS
- PAC
- Area Prone to High Erosion and Landslides
- Streams
- Dirt Road
- Paved Road

Building:

- Demolished
- Standing
- Estimated Location of Concrete/Laboratory Debris
- Approximate Location of Laboratory Debris
- Estimated Location of Incinerator

N W E S

100 0 100 Feet

Scale = 1:2,500
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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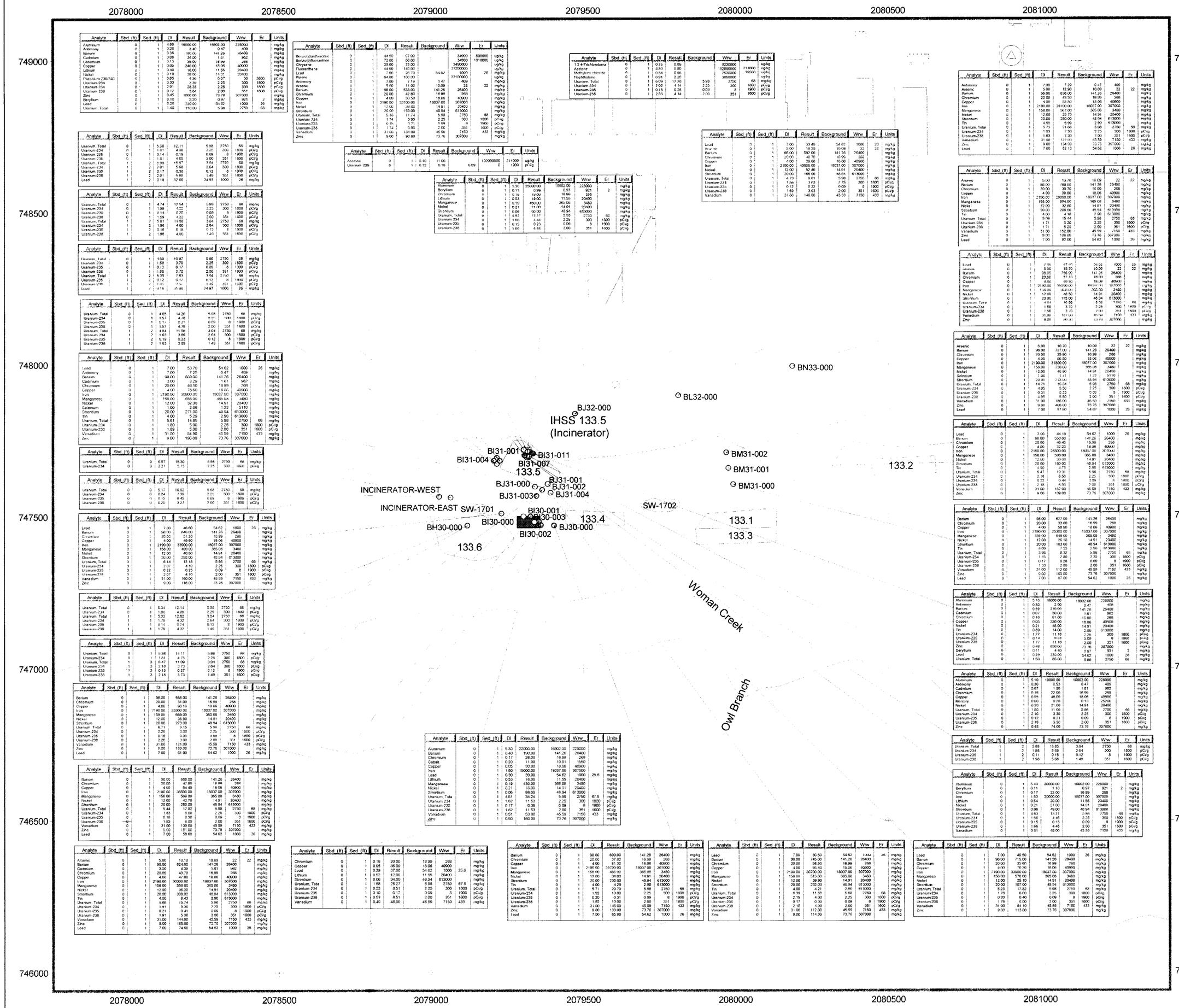
Figure 3
Accelerated Action Sampling Locations and Results at IHSS 133.5 and IHSS 133.6



KEY

- Samples Greater Than Ecological Receptor Action Levels
- Samples Less Than Ecological Receptor Action Levels, But Greater Than Background
- Samples Less Than Background
- IHSS 133.5
- IHSS
- PAC
- Area Prone to High Erosion and Landslides
- Streams
- Dirt Road
- Paved Road

Building:

- Demolished
- Standing
- Approximate Location of Concrete
- Approximate Location of Laboratory Debris
- Estimated Location of Incinerator

N
W E
S

200 0 200 Feet

Scale = 1:5,000
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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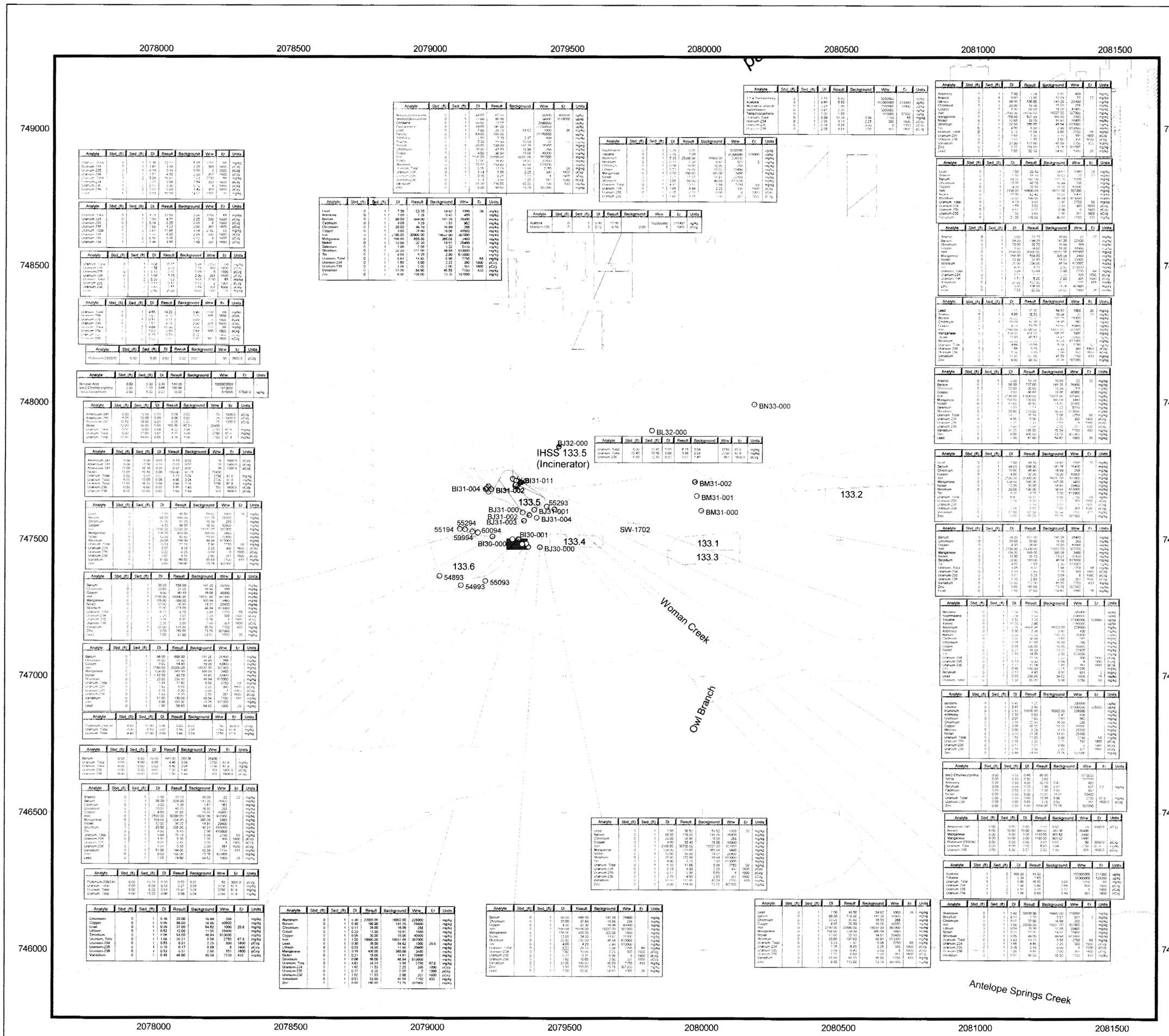

Figure 6
Residual Contamination at IHSS Group SW-1

KEY

- Samples Greater Than Ecological Receptor Action Levels
- Samples Less Than Ecological Receptor Action Levels, But Greater Than Background
- Samples Less Than Background
- IHSS 133.5
- IHSS
- PAC
- Area Prone to High Erosion and Landslides
- Streams
- Dirt Road
- Paved Road

Building:

- Demolished
- Standing
- Estimated Location of Concrete/Laboratory Debris
- Approximate Location of Laboratory Debris
- Estimated Location of Incinerator

N
W E
S

200 0 200 Feet

Scale = 1:5,500
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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